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BIRDS OF
THE PLAINS
BY DOUGLAS DEWAR, F.Z.S., I.C.S.
WITH SIXTEEN ILLUSTRATIONS
FROM PHOTOGRAPHS OF LIVING BIRDS
BY CAPTAIN F. D. S. FAYRER, I.M.S.

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PREFACE

IT is easy enough to write a book. The difficulty is to sell the production when it is finished. That, however, is not the author's business. Nevertheless, the labours of the writer are not over when he has completed the last paragraph of his book. He has, then, in most cases, to find a title for it.

This, I maintain, should be a matter of little difficulty. I regard a title as a distinguishing mark, a brand, a label, a something by which the book may be called when spoken of—nothing more.

According to this view, the value of a title lies, not in its appropriateness to the subject-matter, but in its distinctiveness.

To illustrate: some years ago a lady entered a bookseller's shop and asked for "Drummond's latest book—*Nux Vomica*." The bookseller without a word handed her *Lux Mundi*.

To my way of thinking *Lux Mundi* is a good title inasmuch as no other popular book has one like it. So distinctive is it that even when different words were substituted the bookseller at once knew what was intended. That the view here put forward does not

find favour with the critics may perhaps be inferred by the exception many of them took to the title of my last book—*Bombay Ducks*.

While commanding my view to their consideration, I have on this occasion endeavoured to meet them by resorting to a more orthodox designation. I am, doubtless, pursuing a risky policy. Most of the reviewers were kind enough to say that *Bombay Ducks* was a good book with a bad title. When criticising the present work they may reverse the adjectives. Who knows?

D. D.

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BIRDS OF THE PLAINS

BIRDS OF THE PLAINS

BRITISH BIRDS IN THE PLAINS OF INDIA

MOST birds are cosmopolitans and belong to no nationality. Strictly speaking, there is only one British bird, only one bird found in the British Isles and nowhere else, and that is the red grouse (*Tetrao scoticus*).

For this reason some apology seems necessary for the heading of this article. "Birds common to the Plains of India and the British Isles" would doubtless be a more correct title. However, I write as an Englishman. When I meet in a foreign land a bird I knew in England I like to set that bird down as a fellow-countryman.

In India most of the familiar birds: the thrush, the blackbird, the robin redbreast, the wren, the chaffinch, and the blue tit are conspicuous by their absence; their places being taken by such strange forms as *mynas*, *bulbuls*, seven sisters, parakeets, etc. The Englishman is therefore prone to exaggerate the differences between the avifauna of his own country and that of India. The

dissimilarity is indeed great, but not so great as is generally supposed.

A complete list of British birds comprises some four hundred species; of these nearly one-half occur in India. But a list of British species is apt to be a misleading document. You may keep a sharp look-out in England for a lifetime without ever setting eyes on many of the so-called British birds. Every feathered thing that has been blown by contrary winds, or whose dead body has been washed by the waves, on to the shores of Albion has been appropriated as a British species. This sounds very hospitable. Unfortunately the hospitality is of a dubious nature, seeing that every casual bird visitor promptly falls a victim to the gun of some self-styled naturalist. Having slaughtered his "feathered friend" the aforesaid naturalist proceeds to boast in the press of his exploit.

I do not deem it correct to speak of these occasional visitors as British birds. On the other hand, I think we may legitimately call the birds we see constantly in England, at certain or all seasons of the year, English birds. Of these many are also found in India. More of them occur in the Punjab than in any other part of the country because of our long cold weather, and because, as the crow flies, if not as the *sahib* travels, the Punjab is nearer England than is any other province.

The ubiquitous sparrow first demands our attention. This much-abused little bird is, thanks to his "push," quite as much at home in the "Gorgeous East" as he is in England. He is certainly not quite so abundant out here; the crows and spotted owlets take care of

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that. They are very fond of sparrow for breakfast. Nevertheless, *Passer domesticus* is quite plentiful enough and is ever ready to nest inside one's bungalow.

The Indian cock sparrow differs slightly in appearance from the English bird, having more white on the sides of his neck. This is not, as might be supposed, due to the fact that he is not coated with soot to such an extent as the cockney bird. Every widely distributed species, including man, has its local peculiarities, due to climatic influences, isolation, and other causes. If the isolation be maintained long enough the process of divergence continues until the various races differ from one another to such an extent as to be called species. Local races are incipient species, species in the making. The ~~black~~ owl (*Strix flammea*) is another case in point. This is a familiar owl in England, and is common out here, but not nearly so abundant as the little spotted owlet that makes night hideous by its caterwaulings. The Indian barn owl, which, in default of barns, haunts mosques, temples, deserted buildings, and even secluded verandahs, differs from our English friend in having stronger claws and feet, and the breast spotted instead of plain white. These trivial differences are not usually considered sufficient to justify the division of the barn owl into two species.

Some of our English birds assume diminutive proportions in India, as, for example, the kingfisher and the raven. This may perhaps be attributed to the enervating Indian climate. The common kingfisher (*Alcedo ispida*) is exceedingly common in all parts of India except the Punjab. It does, indeed, occur in

that province, but not abundantly. The commonest kingfisher in the Land of the Five Rivers is the much more splendid white-breasted species (*Halcyon smyrnensis*), which may be recognised by its beautiful blue wings with a white bar, and by its anything but melodious "rattling scream."

This winter the ravens are invading Lahore in very large numbers. It is impossible not to notice the great black creatures as they fly overhead in couples or in companies of six or eight, uttering solemn croaks.

But the Indian raven, large as it is, is a diminutive form; its length is but twenty-four inches as compared with the twenty-eight of its English cousin. Moreover, there are slight anatomical differences between the two races; hence the Indian bird was at one time considered to be a separate species and was called *Corvus lawrencii*. There certainly does seem to be some justification for this procedure, since the Indian raven has not the solitary, shy, and retiring disposition of the bird at Home. It consorts with those feathered villains the Indian crows, and, like them, thieves from man and delights to tease and annoy birds bigger than itself by pulling their tail! But there exist ravens of all sizes intermediate between the large European form and the small Indian one, so that it is not possible to find a point at which a line may be drawn between them. For this reason the Indian raven is now held to be one and the same species as the English bird—*Corvus corax*.

Two cousins of the raven, namely, the rook and the jackdaw, also occur in the Punjab. They both visit us in the cold weather and fraternise with the common



THE WHITE-BREASTED KINGFISHER. (HALCYON SMYRNENSIS)

crows. The rook may be readily distinguished from these by the bare whitish patch of skin in front of its face. Last year hundreds of rooks were to be seen in the fields between the big and the little Ravi. They are not so abundant this winter owing to the comparative mildness of the weather.

The jackdaw is very like *Corvus splendens* in appearance. It may, however, be easily distinguished by its white eye. There is at present a jackdaw in confinement in the Lahore "Zoo."

The coot (*Fulica atra*) is another bird common at Home which is also abundant in India. He needs no description, being familiar—too familiar—to every sportsman in India. He is the "black duck" of Thomas Atkins that remains on the *jhil* after all the duck have disappeared. It is unnecessary to say that the bird is not a duck, but a water-hen that apes the manners of one. His black plumage, white face, and the difficulty he experiences in rising from the water prevent him being confounded with a duck.

Ornithological text-books tell us that the skylark (*Alauda arvensis*) visits India during the winter. This may be so, but I do not think I have ever seen one in the Punjab. I have seen thousands of the Indian skylark (*Alauda gulgula*)—a very similar bird, which is said to soar and sing "just as the lark in England does."

As a rule it soars only at daybreak. There are in India so many birds of prey, ever on the look out for quarry, that our larks are not able to sing with impunity at heaven's gate. They usually put forth their vocal efforts from a less exalted platform.

"The eel's foe, the heron" (*Ardea cinerea*), need not detain us long, although he is a common bird in both England and India, for the Punjab is too dry to be a favourite resort of waders. There is, however, a heron in the "Zoo" at Lahore who lives happily enough among the ducks and storks in spite of the way in which the kites worry him when he is at supper.

The blue-rock pigeon (*Columba livia*) is another English bird found in the Punjab. This must not be confounded with its cousin (*Columba intermedia*) the very common Indian blue pigeon, of which so many have taken up their quarters in the Montgomery Hall. The European form is not nearly so abundant, and is distinguished by its paler colour and by the fact that its lower back is white instead of bluish grey.

The family of birds of prey affords us a large number of species common to England and India. Almost all the well-known English raptiores are found in India —the peregrine falcon, the marsh harrier, the hen-harrier, the merlin, the kestrel, the sparrow-hawk, and the buzzard. All these are considerably more abundant in India than in the British Isles.

Thus far we have spoken chiefly of birds that are found in the plains of India all the year round. We have now to deal with migrants. As was to be expected, many of these are common to Hindustan and to England.

Surprising as it may seem, stationary birds are the exception rather than the rule. The majority of species, like viceroys and lieutenant-governors, divide their time more or less equally between two different

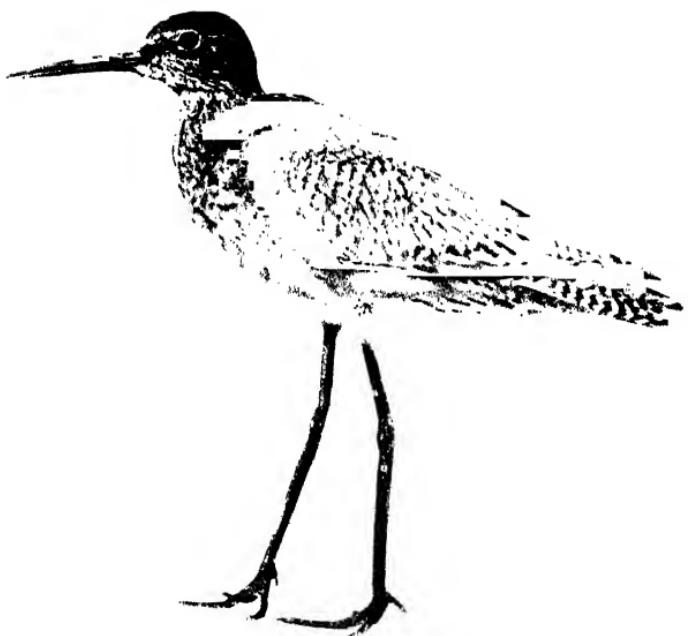
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places. It is by no means always easy to determine whether any particular species is a migrant one or not. The mere fact that specimens of it are seen in any given place at all seasons of the year is not sufficient to prove that it is non-migratory. For the birds of a species we saw six months ago are not necessarily the same ones that we have with us to-day. To take a concrete example, the crested lark (*Galerita cristata*) is found in Lahore all the year round, but is far more plentiful in summer than in winter, which is the only time when it is seen in England. The species is therefore a migratory one.

The general rule as regards migratory birds is that they breed in the north and then go south for a season to enjoy themselves. Great Britain is further north than India and has a much colder climate, hence we should expect birds to crowd to India for the pleasant cold weather and go to England for the genial summer. This does happen to a large extent. Yet there are surprisingly few birds which winter in India and summer in England. The only common ones that I can call to mind are the wagtails, the pipits, and the quail (*Coturnix communis*). There are two reasons for this. The first is that migration takes place in a more or less northerly and southerly direction, and the British Isles are not due north of India. The second reason is that England is a long way south of the Arctic Circle. Its winter is therefore not cold enough for the taste of many birds. Geese, ducks, and snipe are cold-loving creatures. Their idea of nice mild weather is the English winter ! In order to avoid anything in the

shape of heat they migrate very far north in summer, and in winter, being driven southwards by the intense Arctic cold, spread themselves all over the temperate zone. Thus it comes to pass that the full and the jack snipe, the grey lag-goose, the mallard, the gadwall, the pintail and the shoveller ducks, the widgeon and the teal, are winter visitors both to India and the British Isles. But whereas snipe, geese, and most ducks leave India for the hot weather, many of them remain in Great Britain for the summer and nest there. It is probable that the birds which spend the winter in Great Britain go further north to breed, their place in the British Isles being taken by species that have wintered in Africa. The north of Scotland, even, is too far south to serve as a breeding place for some species. The little jack snipe (*Gallinago gallinula*) is one of these; he never breeds in England, whereas the common or full snipe (*Gallinago caelensis*) does. Hence the former is set down as a migrant in England, while the latter is thought to be a permanent resident. In point of fact both are migrants, as we see in India, but while some full snipe find a Scotch summer cool enough for them to breed in, all jack snipe find it insufferably hot.

A curious fact regarding snipe in India is that these birds appear in the south earlier than they do in the north. I do not know the earliest date after the end of the hot weather on which a snipe has been shot in the Punjab, but believe it to be considerably later than the last week in August, at which time snipe are regularly shot in the Madras Presidency. This is not what we should have expected. It is but reasonable to suppose that



THE REDSHANK. (*TOTANUS CALIDRIS*)
(One of the British birds found in India)

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the earliest birds to arrive in India would take up their winter quarters in the north, and that the later arrivals, finding all eligible residences in the north already occupied, would go farther afield. The only explanation of the phenomenon which occurs to me is that the most northerly birds are the first to feel the approaching Arctic winter and so are the first to migrate. These, when they arrive in India, find the northern portion of the peninsula too hot for them, so pass on southwards until they come to the places where the temperature is at that season lower.

This article has already reached an undue length, yet quite a number of birds, more or less common in England and in India, have not been mentioned. On this account I owe apologies to the cuckoo, the stint, the sandpiper, the redshank, the ringed and the Kentish plovers. But the names of these and of eight score others, are they not written in the appendix?

THE BIRD IN BLUE

AS I write my tympanic membranes are being somewhat rudely shaken by the clamorous voices of a brood of young blue jays, which are in a nest somewhere in one of the chimneys of my bungalow.

From the point of view of the blue jays the site they have chosen for their nursery is an admirable one; indeed, had the architect of the bungalow received a handsome "tip" he could not have provided the birds with more comfortable accommodation.

The shaft of the chimney is not straight, as, in my humble opinion, it should be. At a few feet from the top it is bent at a right angle, and runs horizontally for a short distance before it again assumes what I consider to be its normal course.

The architect was, however, not such a fool as he may appear, for it is quite impossible to clean properly the chimney of his design; it must therefore take fire sooner or later, and the fire may spread and result in the destruction of the house. The re-erection thereof would of course mean more work for the said architect.

The blue jays are as satisfied as the designer with the chimney, because the horizontal portion forms a shelf

upon which they can lay their eggs. These are visible neither from above nor from below, and they are as inaccessible as invisible, for the chimney is so narrow as to baffle all attempts at ascent or descent on the part of human beings.

The blue jays make good to my ear what they deny my eye. The young hopefuls utter unceasingly a loud cry resembling that of some creature in distress. This is what I have to listen to all the time I am in the bungalow. Outside, the parent birds make the welkin ring with their raucous voices. Never were father and mother prouder of their offspring or fonder of proclaiming the fact. When not cumbered about much serving they squat either on the roof or on a blue gum tree hard by, and, at regular intervals, utter a short, sharp, harsh "Tshow." This is emphasised by a jerk of the tail; the blue jay does nothing without first consulting its caudal appendage.

On the occasions when I made vain attempts to obtain a look at the young birds the parents took to their wings, and, as they sped through the air, uttered cries so harsh and dry-sounding as to make me feel quite thirsty!

The blue jay is so familiar to us Anglo-Indians as to need no description. We have all admired the bird as it lazily sailed through the air on outstretched pinions of pale blue and rich ultramarine. We have, each of us, watched it perched on a railing looking out for its insect quarry. It is then comparatively inconspicuous, its neck and wing coverts being the hue of a faded port-wine stain. We have seen it pounce upon some object

too small for us to distinguish, and either devour it then and there or bear it off in triumph.

We all know that the bird is not a jay at all, that its proper name is the Indian roller (*Coracias indica*), that it is related to the kingfisher family, and that it is called a jay merely on account of its gaudy plumage.

Next to its colour the most striking thing about the blue jay is its wonderful power of flight. Ordinarily the bird is content to flap along at an easy pace, but, when it likes, it can move for a little as though it were shot out of a catapult; moreover, it is able to completely change its course with startling rapidity; hence even the swiftest birds of prey find it no child's play to catch a roller bird. A good idea of its aerial performances may be obtained by watching it attack a kite that persists in hovering about in the neighbourhood of the nest. Blue jays, like king-crows and doves, are exceedingly short-tempered when they have young.

This species seems to indulge in very little sleep; it is up betimes, and may be seen about long after every other day bird, with the possible exception of the king-crow, is fast asleep.

The blue jay is a good friend to the gardener, since it feeds exclusively on insects and small animals. Jerdon cites as the chief articles of its diet, large insects, grass-hoppers, crickets, mantidæ, and beetles, with an occasional field-mouse or shrew. To this list he might have added frogs and small snakes.

At most seasons of the year the blue jay strikes one as a rather sluggish bird, being content to squat on a perch for a great part of the day and wait patiently for



THE INDIAN ROLLER, OR "BLUE TAY." (*CORACIAS INDICA*)

quarry to come its way. At the breeding season, however, it becomes very sprightly. It is then more than usually vociferous and indulges in a course of aerial gymnastics. It may be seen at these throughout the month of March, now towering high above the earth, then dropping headlong down, to suddenly check itself and sail away, emitting the while the hoarsest and wheeziest notes imaginable, and behaving generally like the proverbial March hare. These performances are either actual love-making or a prelude to it. By the end of March the various birds have sorted themselves out, and then the billing and cooing stage begins.

At this season the birds are invariably found in pairs; the cock and hen delight to sit side by side on some exposed branch. Like the young couples that moon about Hyde Park on Sundays, blue jays do not mind spooning in public. As the sexes dress alike it is not possible to say which of a couple is the cock and which is the hen. Under such circumstances naturalists always assume that the bird which makes the advances is the cock. I am not at all sure that this assumption is justified. Among human beings the ladies very frequently set their caps at the men. Why should not the fair sex among birds do likewise?

In many species the sexes dress differently, and it is then easy to discover which sex "makes the running," and in such cases this is by no means always the cock. I have seen one hen paradise flycatcher drive away another and then go and make up to a cock bird. Similarly I have seen two hen orioles behave in a very unladylike manner to one another, all because they both had

designs on the same cock. He sat and looked on from a distance at the contest, and would assuredly have purred with delight had he known how to do so! But of this more anon. The blue-jay lovers sit on a branch, side by side, and gaze upon one another with enraptured eyes. Suddenly one of them betakes itself to some other tree, uttering its hoarse screeches as it flies. Its companion follows almost immediately and then begins to bow and scrape, puff out its neck, slowly wave its tail, and utter unmusical cries. The bird which is being thus courted adds its voice to that of its companion. The raucous duet over, silence reigns for a little. Then one of the birds moves on, to be followed by its companion, and the above performance is repeated, and will continue to be repeated dozens of times before the birds give themselves over to family cares.

The greatest admirer of the blue jay could not call its nest a work of art. The eggs are laid in a hole in a tree or building. Usually the hole is more or less lined by a promiscuous collection of grass, tow, feathers, and the like, but sometimes the birds are content to lay their eggs in the bare cavity.

The blue jay, although so brazen over its courtship, strongly objects to having its family affairs pried into, so if you would find its nursery you must, unless you are lucky, exercise some patience. The birds steadfastly refuse to visit the nest when they know they are being watched. If patience be a virtue great, the blue jay is a most virtuous bird, for, if it is aware that it is being observed, it will take up a perch and sit there for hours, mournfully croaking, rather than betray the

whereabouts of its eggs or young. Most of the nests I have seen have been discovered by accident. For example, when going along a road I have had occasion to look round suddenly at some bird flying overhead and caught sight of a roller entering a hole in a tree.

Some days ago I was out with a friend, when we saw a hoopoe, with food in its mouth, disappear into a hole in the wall of a Hindu temple. The aperture was about seven feet from the ground, so, in order to look into it, I mounted my friend's back. While I was investigating the hoopoe's hole, a blue jay flew out of another hole in the wall within a yard of my face!

Like Moses of old, I turned aside to investigate this new wonder, and found that the hole went two and a half feet into the wall, and that its aperture was a square six inches in both length and breadth. The floor of this little alcove was covered with earth and tiny bits of dirty straw, which may or may not have been put there by the blue jay. On this lay a clutch of four glossy white eggs, nearly as large as those laid by the degenerate Indian *murghi*. Fortunately for those blue jays I am not an egg collector. As it was, I did remove one of them for a lady who was anxious to have it, but this was not missed. Birds cannot count.

SPARROWS IN THE NURSERY

THE sparrow, as every Anglo-Indian knows, is a bird that goes about dumping down nests in *sahibs'* bungalows. It is greatly assisted in this noble work by the native of India, who has brought to the acme of perfection the art of jerry-building. In the ramshackle, half-finished modern bungalow the rafters that support the ceiling never, by any chance, fit properly into the walls. There are thus in every room a number of cracks, holes, and crevices in which the sparrows love to nest. As a matter of fact, these are not at all safe nesting places. Apart from the fact that the nest is liable to be pulled down at any moment by an angry human being, the situation is dangerous, because there is nothing to prevent a restless young bird from falling out of the nest and thus terminating a promising career. A few days ago a servant brought me a baby sparrow that had fallen out of a nest in the pantry. I always feel inclined to wring the neck of any sparrow that fate has put within my grasp, for I have many a score to pay off against the species. Upon this occasion, however, I felt mercifully inclined, so took the young bird, which was nearly covered with feathers, and offered it bread soaked in milk. This it swallowed greedily. When

the youngster was as full up inside as the Hammersmith 'bus on a wet day, I told the bearer to put it in the cage in which my amadavats dwell. When I left for office I directed the man to feed the new arrival. On my return in the evening the bearer informed me that the young hopeful had declined its food. Now, a young sparrow refuses to eat only when it is stuffed to the brim. It was thus evident that its parents had found it out and were feeding it, in spite of the fact that the nest from which it came was in the pantry on the east side of the house, while its new quarters were in the west verandah.

The next day a second sparrow fell out of the nest in the pantry and was also consigned to the amadavats' cage. At bed-time that night I took a look at the birds, and found that the two young sparrows had tucked themselves snugly in the seed tin! The next morning a third sparrow from the same nest was brought to me; it was put in the cage along with its brethren. As my office was closed on the day in question, I had the cage placed in front of my study window. I could thus watch the doings of the latest additions to my aviary. The hen sparrow does the lion's share of the feeding; she works like a slave from morning to night. At intervals, varying from one to ten minutes, throughout the day she appears with a beakful of food, which consists chiefly of green caterpillars.

It is the custom to speak of the sparrow as a curse to the husbandman. The bird is popularly supposed to live on grain, fruit, seedlings, and buds—those of

valuable plants by preference. There is no denying the fact that the sparrow does devour a certain amount of fruit and grain, but, so far from being a pest, I believe that the good it does by destroying noxious insects far outweighs the harm. Adult sparrows frequently feed on insects. I have watched them hawking flies in company with the swifts, and the skill displayed by the "spadger" showed that his was no 'prentice hand at the game.

Sparrow nestlings in the early stages are fed almost exclusively on caterpillars, grubs, and insects. As there are usually five or six baby sparrows in a brood, and as these have appalling appetites, they must consume an enormous number of insects. Let us work out a little sum. We may assume that the sparrow brings at least three caterpillars in each beakful of food she carries to her brood. She feeds them at least fifteen times in the hour, and works for not less than twelve hours in the day. I timed the sparrows in question to commence feeding operations at 5.30 a.m., and when I left the bungalow at 6 p.m. the birds were still at it. Thus the hen sparrow brings in something like 540 insects *per diem* to her brood. She feeds them on this diet for at least twenty days, so that the brood is responsible for no less than 10,000 insects, mostly caterpillars, before its units are ready to fend for themselves. According to Hume, the sparrow in India brings up two broods in the year. I should have doubled this figure, since the species appears to be always breeding. But it is better to understate than exaggerate. We thus arrive at the conclusion that the hen sparrow

destroys each year over 20,000 insects, mostly injurious, in the feeding of her young. Add to this number those she herself consumes, those the cock eats, and those he brings to the nest, and you have a fine insect mortality bill.

The movements of the mother bird when feeding her young are so rapid that it is not easy to determine what it is she brings to the nest, even though the objects hang down from her beak ; the same applies to the cock. In order to make quite certain of the nature of the food she was bringing, I sought, by frightening her, to make her drop a beakful ; accordingly, at one of her visits I tapped the window-pane smartly just as she was about to ram the food down the gaping mouth of a young bird. She flew off chirruping with anger and alarm, but kept her bill tightly closed on the food she was carrying. As the parents had to feed the young ones through the bars of a cage the process required some manipulation, and, in spite of its care, the bird sometimes dropped part of its burden ; but, almost before I had time to move, it had dashed down to the ground and retrieved it. However, by dint of careful watching I managed to bang the window immediately after the hen had dropped something of a dark colour. Having frightened her away I rushed outside and found that the object in question was part of a sausage-shaped sac containing a number of tiny green grubs. After a few minutes the hen returned with her beak full. Her fright had made her suspicious, so she perched on the verandah trellis-work and looked around for a little. Nine times she flew towards the cage, but on each occasion her

courage failed her, to the intense disgust of her clamouring brood. At the tenth attempt she plucked up sufficient courage to feed the young birds.

At a subsequent visit she dropped a caterpillar, and I frightened her away before she could retrieve it. I found it to be alive and about an inch in length.

On another occasion I saw her ramming something black down the throat of a young hopeful. Frightening her away, I went outside and found the youthful bird making valiant attempts to swallow a whole mulberry. But it was not often that she gave them fruit; green caterpillars formed quite nine-tenths of what she brought in; the remainder was composed chiefly of grubs, with an occasional grasshopper or moth. As the young grew older the proportion of insect food given to them diminished until, when they were about twenty-two days old, their diet was made up principally of grain.

The day on which the third young sparrow was put into the cage was a warm one, so at 2 p.m., when the shade temperature was about 115°, I brought the cage into the comparatively cool bungalow, for the sake of the amadavats. The cock sparrow witnessed the removal of the cage and did not hesitate to give me a bit of his mind. In a minute or so the hen returned with her beak full of green caterpillars. When she found the cage gone, she, too, expressed her opinion of me and of mankind in general in no uncertain terms. It was the last straw. Earlier in the day I had removed one of the baby sparrows from the cage and placed it in a cigar-ash tray outside the cage. The hen had affected not to notice that anything had happened, and

fed it in the ash-tray as though she were unconscious of the removal. When, however, the whole cage and its contents disappeared it was quite useless for her to pretend that nothing was wrong, so she treated me to her best "Billingsgate."

After the cage had been inside for about three-quarters of an hour the young "spadgers" began to feel the pangs of hunger, and made this known by giving vent to a torrent of chirrups which differed in no way from those that make the adult so offensive. All that the poor mother could do was to answer from the outside. I felt, that afternoon, that I was paying off with interest some of my score against the sparrow.

The next day I did not take the cage into the bungalow, because I wanted to ascertain whether sparrows feed their young throughout the day, or whether they indulge in a noonday siesta. They kept it up, at their respective rates, throughout the day, although the thermometer in the shade must have risen to 115°. After the hen had disbursed herself of the food she brought, she would perch for a moment on the trellis, and pant with open beak as though she were thoroughly exhausted.

I have long been trying to ascertain how birds in the nest obtain the liquid they require. Do the succulent caterpillars, on which young sparrows are fed, provide them with sufficient moisture, or do the parents water them? Although I spent several hours in watching those sparrows, I am not able to answer the question satisfactorily. I placed a bowl of water on the ground near the cage, hoping that this would tempt the hen

bird to drink, and that I should see her carry some of the liquid to her offspring. But she took no notice of the water. She certainly used to come to the cage sometimes with her beak apparently empty, and yet insert it into the open mouth of a young one. Was she then watering the nestling, or did her beak hold some small seeds that did not protrude? It seems incredible that unfledged birds exposed to the temperature of an Indian summer require no water; nevertheless, I never actually saw any pass from the crop of the parents to those of the youngsters.

THE CARE OF YOUNG BIRDS AFTER THEY LEAVE THE NEST

IT has been urged as an objection to the Darwinian theory that Natural Selection, if that force exists, must tend to destroy species rather than cause new ones to come into being. Nearly all birds leave the nest before they are fully developed. When they first come out of the nursery they have attained neither their full powers of flight nor complete skill in obtaining food. Every young bird, no matter how fine a specimen it be, leaves the nest an inexperienced weakling, and can therefore stand no chance in competition with the fully grown and experienced members of the species. Natural Selection takes an individual as it finds it and pays no attention to potentialities.

That such an objection should have been urged against the theory of Natural Selection is proof of the fact that naturalists are inclined to forget that, with many, if not all, species of birds, the duties of the parents towards their offspring by no means cease when the young birds leave the nest.

The parent birds, in many cases, continue to feed their young long after these are apparently well able to fend for themselves. This fact is not sufficiently emphasised in books on natural history. On the other

hand, such works lay stress upon the fact that in many species of birds the parents drive their offspring away from the place of their birth in order that the numbers of the species in the locality shall not outgrow the food supply. How far this is a general characteristic of birds I do not know. What I desire to emphasise is that the driving-away process, when it occurs, does not take place until some time after the young have left the nest. The fact that the parent birds tend the young long after they have left the nest, and even after they are fully capable of holding their own in the struggle for existence, disposes of the above-cited objection to the theory of Natural Selection. Nature is so careful of the young warriors that she prolongs the instinct of parental affection longer than is absolutely necessary. So important is it that the young should have a fair start in life that she errs on the safe side.

It is common knowledge that foster-parents feed cuckoos when these have grown so large that, in order to reach the mouth of their spurious babes, the little foster-mothers have to perch on their shoulders.

The sight of a tiny bird feeding the great parasite is laughable, but it is also most instructive. It demonstrates how thoroughly bird mothers perform their duties.

Crows tend their young ones for weeks after they have left the nest. I have had ample opportunity of satisfying myself as to this.

It was my custom in Madras to breakfast on the verandah. A number of crows used to assemble daily to watch operations and to pick up the pieces of food

thrown to them. They would go farther when the opportunity occurred, and commit petty larceny.

The crows were all grey-necked ones, with the exception of two belonging to the larger black species. But these latter are comparatively shy birds, and consequently used to hang about on the outskirts of the crowd.

Among the grey-necked crows was a family of four—the parents and two young birds. Every day, without fail, they used to visit the verandah ; the two young birds made more noise than all the rest of the crows put together. They were easily recognisable, firstly, by their more raucous voices, and, secondly, by the pink inside of the mouth. When I first noticed them they were so old that, in size, they were very nearly equal to the mother. Further, the grey of the neck was sharply differentiated from the black portions of the plumage, showing that they had left the nest some time ago.

Unfortunately I did not make a note of the day on which they first put in an appearance. I can, however, safely say that they visited my verandah regularly for some weeks, during the whole of which time the mother bird fed them most assiduously. It was ludicrous to see the great creatures sidle up to mamma when she had seized a piece of toast, and open their red mouths, often pecking at one another out of jealousy.

They were obviously well able to look after themselves; their flight was as powerful as that of the mother bird, yet she treated them as though they were infants, incapable of doing anything for themselves.

At the beginning of the cold weather I changed my quarters, so was not able to witness the break-up of the crow family. Probably this did not occur until the following spring, when nesting operations commenced.

The feeding of the young after they have left the nest and are full-grown is not confined to crows.

I was walking one morning along a shady lane when I noticed on the grass by the roadside a bird which I did not recognise. It was a small creature, clothed in black and white, which tripped along like a wagtail. It had no tail, but it wagged the hind end of its body just as a sandpiper does. While I was trying to identify this strange creature, a young pied wagtail came running up to it with open mouth, into which the first bird popped something. I then saw that the unknown bird was simply a pied wagtail (*Motacilla maderaspatensis*) which had lost her tail! The young bird was fully as large as the mother, and having a respectable tail, which it wagged in a very sedate manner, looked far more imposing. The parts of the plumage which were black in the mother were brownish grey in the young bird. The white eyebrow was not so well defined in the youngster as in the adult, while the former had rather more white in the wing, but as regards size there was nothing to choose between the two. The young bird remained in close attendance on the mother. It was able to keep pace with her as she dashed after a flying insect. It ran after her begging continually for food. The mother swallowed most of the flies she caught, but now and again put one into the mouth of the young bird, but she

did so very severely, as if she were saying, "You are far too old to be fed ; it is no use to pretend you cannot catch insects, you are a naughty, lazy, little bird !" But the lackadaisical air of the young one expressed more plainly than words : "Oh, mother, it tires me to chase insects. They move so fast. I have tried, but have caught so few, and am very hungry."

For several minutes the young wagtail followed the mother ; then something arrested its attention, so that it tarried behind its parent. The mother moved away, apparently glad to be rid of the troublesome child for a little. Then she suddenly flew off. Presently the young wagtail looked round for its mother, and I was interested to see what would happen when it noticed that she had flown away. My curiosity was soon satisfied. Directly the young bird perceived that the mother had gone, it set itself most philosophically to catch insects, which it did with all the skill of an old bird, turning, twisting, doubling, with the elegance of an experienced wagtail.

I describe these two little incidents, not as anything wonderful, but as examples of what is continually going on in the world around us.

The parental instinct is probably developed in some birds more than in others, but I believe that in all cases the affection of a bird mother for her young persists long after they have left the nest, and for some time after they are fully capable of looking after themselves.

Birds are born with many instincts, but they have much to learn both before and after they leave the nest.

It is not until their education is complete, until the mother bird has taught them all she herself knows, until they are as strong or stronger than she, that the young birds are driven away and made to look after themselves.



THE INDIAN ADJUTANT. (*LEPTOPHIS DUBIUS*)

THE ADJUTANT BIRD

THE adjutant bird (*Leptoptilus dubius*) is one of Nature's little jokes. It is a caricature of a bird, a mixture of gravity and clownishness. Everything about it is calculated to excite mirth—its weird figure, its great beak, its long, thin legs, its conspicuous pouch, its bald head, and every attitude it strikes. The adjutant bird is a stork which has acquired the habits of the vulture. Forsaking to a large extent frogs and such-like delicacies, which constitute the normal diet of its kind, it lives chiefly upon offal. Now, most, if not all, birds which feed on carrion have the head and neck devoid of feathers. This arrangement, if not ornamental, is very useful. The bare head and neck are, as "Eha" remarks, "the sleeves tucked up for earnest work." The adjutant forms no exception to the rule, it wears the badge of its profession. But let me here give a full description of this truly comic bird. It stands five feet in its stockings. Its bill is over a foot in length and correspondingly massive. As we have seen, the whole head and neck are bare, except for a few feathers scattered over it like the hairs on an elephant's head. The bare skin is not lacking in colour. On the forehead it is blackish; it becomes saffron-yellow on the upper neck, while lower

down it turns to brick-red. There is a ruff of white feathers round the base of the neck. This ruff, of course, appears entirely out of place and adds to the general grotesqueness of the bird. The back and wings are ashy black, becoming slaty grey at the breeding season. The lower parts are white.

As if the creature, thus arrayed, were not sufficiently comic, Nature has given it a great pouch which dangles from the neck. This is over a foot in length and hangs down like a bag when inflated. It is red in colour, spotted with black. Its situation naturally leads one to believe that it is connected with the gullet, that it is a receptacle into which the bird can hastily pass the garbage it swallows pending more complete disposal. But it is nothing of the sort. It does not communicate directly with the oesophagus. Knowing this, one is able to appreciate to the full the splendid mendacity of the writer to *Chambers's Journal* in 1861, who declares that he witnessed an adjutant swallow a crow which he watched "pass into the sienna-toned pouch of the gaunt avenger. He who writes saw it done."

Note the last sentence. The scribe was evidently of opinion that people would not believe him, so thought to clinch matters by bluffing! But, to do him justice, it is quite possible that he did see an adjutant swallow a crow, for other observers have witnessed this, but the remainder of the story rests upon the sandy foundation of the imagination. If the truth must be told, we do not know for certain what the use of this pouch is. Blyth suggested that it is analogous to the air cell attached to one lung only of the python or the boa-

constrictor, and, as in that case, no doubt supplies oxygen to the lungs during protracted meals. The bird can thus "guzzle" to its heart's content without having to stop every now and then to take a "breather."

But we must return to the appearance of the bird, for the account of this is not yet complete, since no mention has been made of the eye. This is white and very small, and so gives the bird a wicked, knowing expression, like that of an elephant. Colonel Cunningham speaks of "the malignantly sneaking expression of the pallid eyes." This is perhaps a little severe on the adjutant, but it is, I fear, quite useless to deny the fact that he has "a canister look in his heye."

A mere description of the shape and colouring of the adjutant does not give any idea of his comicality. It is his acts rather than his appearance that make him so ludicrous. Except when floating high above the earth on his great pinions the bird always looks grotesque. To say that he, as he walks along, recalls a hunch-backed old man who is deliberately "clowning" is to give a hopelessly inadequate idea of the absurdity of his movements. Lockwood Kipling is nearer the mark when he says: "For grotesque devilry of dancing the Indian adjutant beats creation. Don Quixote or Malvolio were not half so solemn or mincing, and yet there is an abandonment and lightness of step, a wild lift in each solemn prance, which are almost demoniacal. If it were possible for the most angular, tall, and demure of elderly maiden ladies to take a great deal too much champagne and then to give a lesson in ballet dancing, with occasional pauses of acute sobriety, perhaps some

faint idea might be conveyed of the peculiar quality of the adjutant's movements."

Sometimes the bird struts along solemnly with bent back and forwardly pointed bill, at others it will jump or skip along with outstretched wings and clap its beak. It cannot even stand still without striking ludicrous attitudes. Seen from behind, it looks like a little hunch-backed old man with very thin legs, dressed in a grey swallow-tail coat. Adjutants sometimes vary the monotony of existence by standing on one leg; occasionally they sit down, stretching their long legs out in front, and looking "as though they were kneeling wrong side foremost."

Colonel Cunningham gives a most entertaining account of the habits of these birds, many of which used, until quite recently, to be seen about Calcutta. My observations are chiefly confined to birds in captivity; this perhaps accounts for the fact that they do not agree in all respects with those of the Colonel. According to him, adjutants "are singularly ill-tempered birds, constantly squabbling with one another, even in the absence of any cause of competition, such as favourite roosts or specially savoury stores of offal. Even whilst several of them are standing quietly about, sunning themselves and apparently buried in deep thought, a quarrel will suddenly arise for no apparent reason; and then you may see two monstrous fowls begin to pace around, cautiously stalking one another, and watching for a favourable opportunity of striking and buffeting with beak and wings. The expression of slow malignity with which such duellists regard one

another is gruesome, and the injuries resulting from the fray are often ghastly; blinded eyes and bloody cocks-combs being matters of everyday occurrence."

Captive adjutants seem to be most placid birds. There are three of them in the "Zoo" at Lahore, kept in a large park-like enclosure, and I have never seen these fighting. They appear to be always, if not on the best of terms, at any rate, indifferent to one another. The three will stand for many minutes at a time in a row, motionless as statues. Sometimes a male and a female will huddle up to one another and remain thus, with their heads almost touching, looking like caricatures of Darby and Joan.

The table manners of adjutants, like those of most other carrion feeders, are not polite. I will therefore not attempt to describe them. In the good old days, feeding adjutants used to be a favourite pastime of Mr. Thomas Atkins at Calcutta. I regret to have to say that his motives were not always purely philanthropic. To connect two pieces of meat by a long string and then throw them among a crowd of adjutants savours of practical joking. One bird, of course, swallows one piece of meat, while a second adjutant secures the other morsel. All goes well until each of the birds tries to go its own way—then a tug-of-war results, fraught with gastronomical disturbance to the combatants.

Adjutants are nowhere very abundant; they are nevertheless spread over the whole of Northern India, but do not appear to be found so far south as Madras. Another species, however—the smaller adju-

tant (*L. javanicus*)—has been observed on the Malabar coast.

Some natives make adjutant-catching their profession. The birds are captured on account of their down-like feathers, which are of considerable commercial value.

The catcher fits the skin of an adjutant over his head and shoulders, and in this attire creeps up to a company of the birds as they stand half-asleep, knee-deep in water. Great is the surprise of the unsuspecting birds when one of them is unceremoniously seized by the wolf in the adjutant's skin.



THE INDIAN ADJUTANT. (*LEPTOPHIS DUBIUS*)

THE SARUS

HAVING discoursed upon the adjutant, it seems but fitting that we should turn our attention to another long-shanked gentleman—the sarus. The adjutant is, as we have seen, a stork, while the sarus is a crane. I do not know whether this conveys very much information to the average mind. Most people will, I imagine, “give it up” if asked, “What is the difference between a stork and a crane?” Yet there are considerable differences between the two; they belong to different families, and, like rival tradesmen of the same name, “have no connection with one another.” I do not propose to detail the anatomical differences between storks and cranes, for the excellent reason that I myself do not know them all, nor have I the least intention of acquiring such knowledge. It forms part of the dry bones of science, and these are best left to museum ornithologists to squabble over. There are, however, one or two simple points which suffice to enable us to distinguish at a glance a crane from a stork. The hind toe of the stork is well developed, while that of the crane is small and does not touch the ground; the consequence is that the stork likes to rest on trees, while the crane prefers to stand on *terra firma* on its flat feet.

The nostrils of the crane are half-way down the beak, while they are at the base in the bill of the stork. The crane nests on the ground ; the stork builds in a tree. Young storks are helpless creatures, while little cranes hop and run about from the moment they leave the egg. Lastly, the crane has a voice, a fine loud voice, a voice that can be heard a mile away, a voice like a trumpet, for its windpipe is coiled. King stork, on the other hand, has no voice ; when he wants to make a joyful noise he is obliged to clap together his great mandibles.

Cranes have been favourites with man from time immemorial. The result is that ancient and mediæval writers have plenty to say about them. Now the naturalist of old considered himself in honour bound to attribute some wonderful characteristic to every beast of which he wrote. If he did not know of any clever thing done by any creature, he invented something for it to do. This method had the advantage of making natural history a very exciting and interesting study. Cranes were supposed to perform all manner of tricks with stones. As we have seen, they are blessed with powerful voices, and, like other loud-voiced people, find it difficult to keep silent. They are fully persuaded that silence is golden ; but, when it comes to acting up to this belief, the flesh proves itself very frail. Thus it came to pass that the sagacious birds, when migrating, used to stop up their mouths with stones. As they are far too well-bred to speak with the mouth full, they were able to maintain a decorous silence when travelling.

I can cite plenty of authority for this statement. There is, in particular, no less a personage than "Robert Tanner, Gent. Practitioner in Astrologie and Physic." "The cranes," he writes, "when they fly out of Cilicia, over the mountain Taurus, carried in their mouths a pebble stone, lest by their chattering they should be ceased upon by eagles."

The cranes had yet another use for their stones. When the main body were resting at night, sentinels were posted to guard against surprise, so that the company could go to sleep in security. To ensure necessary vigilance, the sentinels stood on one foot and held in the other a large stone. If they inadvertently nodded, their muscles relaxed and the stone dropped. This, of course, used to wake them up. Even Alexander the Great was glad to learn a lesson from the cranes. He used to go to roost with, not a stone in his hands, but a silver ball, as more befitting his royal dignity. On the slightest movement the ball would fall and he wake up. Thus it was that he never overslept himself. We do not do such heroic things nowadays ; nor do cranes.

Cranes are birds which will not stand nonsense. The pygmies used to go egg-collecting among them ; the result of this was, to translate Homer :—

When inclement winters vex the plain,
With piercing frosts, or thick descending rain,
To warmer seas the cranes embodied fly,
With noise and order, through the midway sky :
To pygmy nations wound and death they bring.

Notice that as the cranes were on the war-path there was no necessity for them to fill their mouths with

stones ; they wanted all their lung power to bark at their pigmy foes.

Having considered cranes as they are not, it behoves us to glance at them as they are. The sarus is a handsome creature. It stands over five feet high. The general colour of the plumage is a beautiful French grey. The head and long neck are devoid of feathers, but are covered with numerous tiny crimson warts or papillæ. These assume a deeper hue at the breeding season, which occurs from July to September. There is a patch of grey on the sides of the head. The throat and a ring round the nape are covered with black hairs.

Saruses feed upon vegetable substances, insects, earth-worms, frogs, lizards, and other small reptiles, with an occasional snake thrown in by way of condiment. "This," remarks Babu Ram Brama Sanyal, "shows the kind of accommodation they must have."

Saruses are not gregarious birds, but hunt in couples and are said to mate for life. It is further asserted that when one of a pair is killed the other pines away and dies. I believe this to be true, although I cannot vouch for it, and am certainly not going to put the statement to the test by shooting one of a pair : for these cranes are such tame, confiding birds that to shoot them savours strongly of murder.

According to Jerdon, a young sarus is not bad eating, but old birds are worthless for the table. Lucky old birds ! Saruses thrive very well in captivity. As they habitually indulge in all manner of eccentric dances they make most amusing pets. They are usually gentle and let strangers caress them and tickle their heads. But I

always let others try this on for the first time with a strange crane, because some birds resent this head-tickling and, to again quote from the worthy Babu above mentioned, "appear to exist only as it were for pecking at everything, bird, beast, and man: children being the special object of their wrath."

There are two cranes in the "Zoo" at Lahore; they are a most mischievous couple. They used to be kept with the ducks and geese, and amused themselves by rooting up all freshly planted rushes. At feeding time it was their habit to hop from one dish of food to another with outstretched wings and thus frighten off the ducks and secure the lion's share for themselves. They were then removed to the enclosure where the adjutants are. They started playing tricks on these, but the adjutant has a powerful beak which he is quite ready to use when necessity arises. The result is that the saruses are not on speaking terms with the adjutants.

Unlike the adjutant, whose nest is a huge platform of sticks placed on the top of a very lofty tree, the sarus builds its nursery on the ground. This takes the form of a large cone, several feet in diameter at the base and two or three feet high. It is composed of reeds, rushes, and straw, and placed by preference in shallow water. Great care is taken to keep the eggs above water level. If, as is apt to happen in India, heavy rain comes on after the completion of the nest, the parents speedily set to work to raise the eggs by adding more material to that upon which they rest.

THE STABILITY OF SPECIES

If two crows be taken to an ornithologist and he be told that one of them was caught in the Himalayas while the other was captured in Madras, he will not be able to tell which individual came from which area: in other words, the crows of Madras resemble those of the Himalayas. This, of course, is no unusual phenomenon. The same may be said of the myna, the king-crow, and a great many other birds and beasts. Yet the phenomenon is a remarkable one if we take into account the facts of variation.

If several hundred thousand crows be collected and carefully examined, it will be found that no two of them resemble one another in all respects. This being so, we should expect the crows of Madras to differ from those of the Himalayas, since the two environments are so dissimilar. We may say with tolerable certainty that no intercrossing takes place between the crows of the two localities: for these birds are stay-at-home creatures, and do not wander far afield. In this case, therefore, it is not intercrossing that has prevented the origin of local races.

A consideration of the main causes which conduce to the stability of species may not be devoid of in-

terest ; for the subject is one which has hitherto attracted but little attention. Since the Darwinian hypothesis was given to the world we have heard so much of variation and the origin of new species that the other phenomenon—that of the fixity of species—in spite of varying environments has been almost entirely overlooked. Yet it was just this feature of animal life that attracted the attention of the older zoologists and led them to believe that species had been created once and for all, and that, when created, they were immutably fixed.

Most biologists, if asked to explain the comparative fixity of species, the slowness of evolution, would, I think, refer to the fact that variations appear to take place indiscriminately in all directions. Take, for example, a large number of birds of any species and measure any one organ, let us say the first primary wing feather. Suppose the average length be six inches. We shall find that in a considerable percentage of the individuals measured the wing is exactly six inches in length : that six inches is what we may call the favourite or fashionable length of the wing. The next commonest lengths will be 5·99 and 6·01 inches, and so on. We shall find that only a very small percentage of the individuals have wings shorter than 5½ inches or longer than 6½ inches ; and if we measured a thousand individuals we probably should not find any in which the wing was shorter than five inches or longer than seven.

Now, the commonly accepted theory is that in those cases where there is free interbreeding the long-winged varieties and the short-winged varieties tend to neutralise

one another, hence no change in character takes place. The effects of variation are swamped by intercrossing. It is only when intercrossing is checked, as when natural selection weeds out certain varieties, that evolution occurs.

This theory, of course, explains, or helps to explain, why species are so stable; but it involves the assumption that there is no such thing as sexual selection among animals in a state of nature. The theory assumes that individuals mate in a haphazard manner, that a long-winged hen is as likely to select a short-winged husband as a long-winged one. Are we justified in assuming this? At present there is little evidence on the subject. Evidence can only be procured by measuring a number of pairs of birds that have mated, and seeing whether large hens mate chiefly with large cocks or with small cocks, or indifferently with large or small cock-birds.

That sexual selection is a reality and not a mere hypothesis there can, I think, be but little doubt. It is with the theory that supposes that the females alone exercise selection that I feel compelled to quarrel. The male selects his partner just as much as the female selects hers. The choice is mutual.

In the Zoological Gardens at Lahore there are a number of ordinary coloured peacocks and a number of albinos. No coloured hen will mate with a coloured cock if she is allowed to exercise a choice between him and an albino. Here, then, is a clear example of sexual selection.

Professor Karl Pearson has spent much time in trying

to discover whether there is such a thing as sexual selection—what we may call unconscious selection—among human beings. His experiments tend to show that there is.

If we take a thousand married men whose stature is not less than six feet, and a thousand also who are none of them taller than 5 ft. 8 in., we shall find that the average height of the wives of the former is greater than that of the wives of the shorter men.

If wild animals display a similar characteristic, it is evident that to say that intercrossing swamps variation and causes species to remain stable is not altogether accurate ; for, if like select like as partners, we should expect a number of races to rapidly arise, or, at any rate, three races—a large, medium, and small one. So far, however, as we can see, species display no such tendency. We are therefore driven to the conclusion either that there is among species in a state of nature no tendency for like individuals to select like as their partners, or, if there be such a tendency, there is some force at work which counteracts it.

It may be thought that the case of the peafowl in the Lahore "Zoo" tends to show that among animals it is dissimilarity, not similarity, that attracts, for the coloured hens mate with white cocks in preference to those like themselves.

As a matter of fact the hens select the white cocks, not because they are white, but because of the strength of the sexual instincts of these latter. The white cocks continually show off before the hens ; the sexual desire is developed more highly in them

than in the ordinary cocks, and it is this that attracts the hens.

We must also bear in mind that abnormal variations have a strong tendency to perpetuate themselves. If a white cock mates with an ordinary peahen, the majority of the offspring are pure white.

If there be such a thing as sexual selection, and if it be, as I believe, the strongest, the most mettlesome individuals, those in which the sexual instincts reach the highest development, that attract the opposite sex, then the question arises: is there any connection between these characteristics and the size and colour of their possessor? We are not in possession of sufficient data to answer this question in the affirmative. Nevertheless I believe that such a relation does exist.

The researches of Professor Pearson seem to point to the fact that there exists a definite relation between variation and fertility. For every species there is a mode or typical size and form, and from this there are deviations in all directions, and, speaking generally, the greater the deviation from the mode the less the fertility of the individual.

If this be a general law we have here a very potent factor tending to make species stable. Those individuals which deviate least from the common type are the most fertile; they produce the most offspring; moreover, they are the most numerous, hence they, by sheer force of numbers, keep a species stable. The abnormal individuals are comparatively few in number, and they beget comparatively few of their kind, so have no chance of establishing themselves and crushing out

the normal type, unless natural selection steps in to their aid.

Is comparative infertility the result of feebleness of the sexual instinct? If so, sexual selection must be conducive to the stability of species.

For if the rule be the greater the deviation of an individual from the normal the less the development in it of the sexual instinct and the less its fertility, it follows that an abnormal organism is less likely to find a mate than a normal individual is; and if it do succeed in forming a union, that union will probably produce less than the average number of offspring.

THE AMADAVAT.

“GENTLEMEN,” said a Cambridge professor to his class, “I regret that owing to the forgetfulness of my assistant, I am unable to show you a specimen of the shell of the mollusc of which we are speaking. You have, however, but to step into the parlour of any seaside lodging-house and on the mantelpiece you will see two of the shells in question.” Every undergraduate immediately knew what the shell was like; so will my readers at once recognise the bird of which I write when I inform them that the amadavat is the little red bird with white spots that occurs in every aviary in India. The bird is, indeed, not all red, but the bill is bright red and there are patches of this colour all over the plumage—more in the cock than in the hen, and more in the former in the breeding season than at other times. Thus the general effect is that of a red bird; hence the native name *Lal munia*, which, being interpreted, is the red munia. This is the proper English name of the bird, although fanciers frequently call it the red waxbill. Men of science know it as *Sporæginthus amandava*. I may say here that the name avadavat or amadavat is derived from Ahmedabad, whence great numbers used to be exported, for the bird is a great favourite in England.

It is the cage bird of India *par excellence*. Hundreds of thousands of amadavats must at this moment be living in captivity. The bird takes to cage life as a Scotsman to whisky. Within five minutes of capture the little creature is contentedly eating its seed and singing quite gaily. This is no exaggeration. I was recently out with a friend when we came upon a small boy catching munias. We saw captured a fine cock which my friend purchased for two annas. Not happening to have a cage in his pocket, he put the tiny creature into a fold of his handkerchief and placed the remainder of the handkerchief in his pocket. While we were walking home our captive began twittering in answer to his companions who were still free. If this be not philosophical behaviour, I do not know what is.

Nothing is easier than to catch munias. All that is required is the common, pyramidal-shaped, four-anna wicker cage in which birds are usually carried about in India. To the base of one of the walls of this a flap is attached by a hinge. The flap is the same size and shape as the wall of the cage, and composed of a frame over which a narrow-meshed string net is stretched. A string is fastened to the apex of the flap. The cage, with a captive bird inside, is placed in the open so that the flap rests on the ground. On this some groundsel is thrown. In a few minutes a passing amadavat is attracted to the cage by the song of the bird inside. The new-comer at once begins to feed on the groundsel. Then the bird-catcher, who is seated a few yards away, pulls the string sharply, so that the flap closes over the side of the cage and thus the bird is secured. It is then

placed inside the cage and the flap again set. In this manner a dozen or more amadavats can be captured in an hour. As nine red munias are sold for a rupee, and as they will live for years in captivity and cost next to nothing to keep, it is not surprising that they are popular pets.

Moreover, the amadavat is no mean songster. "Eha" is, I think, a little severe on the bird when he states that "fifty in a cage make an admirable chorus." The bird is small, so is its voice, but what there is of the latter is exceedingly sweet. Were its notes only louder the bird would be in the first rank as a songster. A rippling stream of cheery twitters emanates unceasingly from a cage of munias. The birds seem never to tire. The cock frequently utters, in addition to this perpetual twitter, a warble of five or six notes. The birds love to huddle together in a row on a perch and twitter in chorus. Suddenly the chorus ceases; one of the birds raises his head above the level of the others and sings a solo, while the rest listen in silence with the air of connoisseurs. When he has finished, another bird has a "turn," then another. The whole performance always puts me in mind of one of those impromptu concerts which soldiers are so fond of getting up.

Quite apart from their song, munias afford him who keeps them much pleasure, because they are most amusing birds to watch. They are very fond of heat. They are happiest when the thermometer stands at about a hundred. When they huddle together for the sake of warmth, all are content except the two end birds, who are kept warm only on one

side. No bird, therefore, likes to be an outside one of a row. If two or three, sitting close together, are joined by another, this last does not take up a position at the end of the line. He knows a trick worth two of that. He perches on the backs of two in the middle and tries to wedge himself in between them. Sometimes he succeeds. Sometimes he does not. When he does succeed he frequently upsets the equilibrium of the whole row.

Needless to say, the birds roost huddled together, and at bed-time there is great manœuvring to avoid an outside position. Each tries to get somewhere in the middle, and, in order to do so, adopts one of two methods. He either flops on top of birds already in position, and, if he cannot wedge himself in, sleeps with one foot on the back of one bird and the other on its neighbour's back. The birds do not seem to mind being sat upon in this way. The other method is for the two outer birds to press inwards until one of those in the middle of the row is squeezed so hard as to lose its foothold and be violently ejected upwards. The bird thus jockeyed out of its position then hops to one end and in its turn begins to push inwards, and so the process continues until the birds grow too sleepy to struggle any more. All this contest is conducted without a sound. There is no bickering or squabbling. The only thing I know like it is the contest in the dining-room of an Indian hotel, when two "boys," each belonging to a different master, seize a dish simultaneously. Each is determined to secure that dish, and neither dares utter a sound for fear of

angering his *Sahib*. Thus they struggle in grim silence. Eventually one is victorious and walks off in triumph with the dish. The defeated servant at once accepts the situation ; so is it with a munia ejected from a central position.

Although amadavats are widely distributed in India and fairly common in most parts of the country, they usually escape notice on account of their small size: When flying overhead they are probably mistaken for sparrows. Moreover, they do not often visit gardens ; they prefer open country.

Amadavats belong to the finch family, to the great tribe which includes the sparrow, the canary, and the weaver-bird. By their coarse, stout beak, tapering to a point, you may know them. The use of this big beak is to husk grain. Finches do not gobble up their seed whole as pigeons or fowls do ; they carefully husk each grain before swallowing it. Hence the meal of a bird of this family is a somewhat protracted affair. He who keeps an aviary should remember this and provide his birds with several seed-boxes, otherwise one or two bullies (for there are bullies even among tiny birds) are apt to monopolise the food.

He should also bear in mind that Nature does not provide her feathered children with teeth. Seed-eating birds, therefore, habitually swallow small stones and pieces of grit. These perform the function of millstones inside the bird. From this it follows that it is cruel to keep seed-eating birds without supplying them with sand and grit.

The bone of a cuttle-fish, tied to the wall of the cage,

is much appreciated by all the finch tribe and helps to keep them in condition.

The nest of the amadavat is a large ball of fibrous material, somewhat carelessly put together, with a hole at one side by way of entrance. Winter is the season in which to look for the nests, but they are not easy to find, being well concealed in low bushes. Six pure white glossless eggs are usually laid.

THE NUTMEG BIRD

THE nutmeg bird or spotted munia (*Uroloncha punctulata*) is second only to the amadavat as an aviary favourite. The two species are almost invariably caged together. This is, perhaps, the reason why I was once gravely assured by a lady that the spotted munia is the hen and the amadavat the cock of one and the same species! Needless to say, the birds, although relatives, belong to different genera. The stouter bill of the spotted munia proclaims this. In colour the beak is bluish black or dark slate colour, and contrasts strongly with the chocolate-brown of the head, neck, back, wings, and tail. The breast is white with a number of black rings, which give it the appearance of a nutmeg-grater, hence the popular name of the bird. Fanciers go one better and call it the spice bird. If in years to come the former name be forgotten, etymologists will put their wise heads together and puzzle and wrangle over the derivation of the name "spice bird"!

The habits of the spotted munia are those of the amadavat. Like the latter, it seems to thrive in captivity; it also loves warmth, and likes to go to roost with a warm companion on each side of it. Red and spotted munias live together very amicably in a cage; but as

the latter, owing to their less showy plumage, are usually in a minority, they have to be content with outside positions at roosting-time. Sometimes my munias take it into their tiny heads to sleep on a perch which runs across a corner of the cage, and is barely long enough to accommodate them all. There are several other finer and longer perches, but, for some reason or other, they seem to prefer this one. Possibly its breadth is better adapted to the grip of their feet than that of any of the others. I may here say, in parenthesis, for the benefit of those who keep cage birds, that every cage should contain several perches of varying diameter, so as to permit the inmates of the cage the luxury of a change of grip.

Well, when a dozen birds persist in roosting on a perch intended only to seat ten, at least one of them is unable to find room on the perch, and is obliged either to sleep on the backs of some of his companions or make-believe that he is roosting on the perch. This latter feat is accomplished by the bird clutching hold of the two wires between which the perch passes and maintaining himself at an angle of 45° with the vertical. In this attitude a bird will sometimes sleep! Of course, its body is in part resting on that of its neighbour, but, allowing for this, a more uncomfortable position is inconceivable to a human being. The spotted munia, however, seems to find it tolerably comfortable.

Birds sleep standing, often on one leg. Did this require any appreciable muscular effort on the part of the bird there could be no rest in such an attitude, and the bird would fall off its perch as soon as it went to

sleep. As a matter of fact, the muscles and tendons of a bird's hind-limb are so arranged that, to use the words of Mr. F. W. Headley, "when the leg bends at the ankle, there is a pull upon the tendons, the muscles are stretched, the toes are bent and grasp the perch on which the bird sits. Thus he is maintained by his own weight, which bends the leg and so causes the toes to grip." Thanks to this feature of their anatomy, passerine birds are able to sleep on branches of trees out of reach of prowling beasts of prey.

The great force with which a bird grasps its perch is worthy of note. As every hawker is aware, a falcon, when carried on the wrist, grips the leather gauntlet so tightly as to almost stop the circulation of the blood in the hand of the carrier. A fox cannot open its mouth when once its snout is in the iron grip of an eagle. Examples of the power of the grip of the foot of a passerine bird will occur to every one who has had much to do with our feathered friends. Crows habitually roost in the topmost branches of trees, which must be very violently shaken in a gale of wind; yet the birds never seem to lose their hold.

I have said that the habits of the spotted munia are those of the amadavat; what was said of the latter applies to the former, with one exception. The spotted munia is no songster. Those who keep the bird must have seen him go through all the motions of singing, with a considerable display of energy, but scarcely a sound seems to issue. You may perhaps hear the feeblest noise, like that made by a wheezy and decrepit mosquito. When you see the bird's mandibles

moving nineteen to the dozen with scarcely a sound issuing, you are inclined to think that he is either playing dumb crambo or that he has taken leave of his senses. Nothing of the kind. The bird is singing his top notes, which are doubtless greatly appreciated by his mate. Sound is, as we all know in this scientific age, vibration appreciable to the ear. Air is the usual vibrating medium. Only certain vibrations are perceptible to the human auditory organ. Those having a recurrence of below thirty or above sixteen thousand per second do not produce the sensation of sound to the average human ear. There are thus numbers of vibrations continually going on which are lost to us; to this category belong the vibrations in the air produced by the vocal cords of the spotted munia. The ear of a bird is constituted very differently from that of man, so that it is not surprising if birds can hear certain sounds imperceptible to us human beings. I may here say that the range of the human ear varies greatly in different individuals. Some men can hear vibrations of which the recurrence is but fifteen in the second, while others are said to appreciate notes caused by forty thousand vibrations per second. I have a friend who cannot hear a black partridge when it is calling; its notes are too high for the unusually limited range of his ear. I do not know if there are any people to whom the note of the nutmeg bird sounds quite loud; if there be, and these lines meet their eye, I hope they will give their brethren of more limited capacity the benefit of their experience.

THE DID-HE-DO-IT.

Mrs. "did-he-do-it" is a dandy of the first water. I should like to add "and so is his wife," for she dresses exactly as he does, and is every bit as particular regarding her personal appearance, but owing to the peculiarity of our Anglo-Saxon tongue, it is incorrect to apply the term "dandy" to a lady, and there appears to be no feminine equivalent of it. I must therefore be content to say that Mrs. Did-he-do-it is a dressy little person. Before describing the attire of the Did-he-do-it let me say that the bird is correctly styled the red-wattled lapwing. Ornithologists used to call it *Lobivanellus goensis*, but this was found to be a bit of a mouthful for even an ornithologist; accordingly the bird is now named *Sarcogrammus indicus* for short.

The Did-he-do-it belongs to the noble family of plovers. Its head, neck, and upper back are black, and the under parts are white. A broad white band runs down each side of the neck from the eye to join the white of the under parts. The wings are of a beautiful greenish-bronze hue; the legs are bright yellow. The beak is crimson-red, as is the forwardly pointing wattle which forms so conspicuous a feature of the bird's physiognomy. The lapwing is thus an easy

bird to identify. Even if you cannot see him, you know he is there the moment you hear his loud, shrill "Did he do it, pity to do it." The only bird with which he can possibly be confounded is his cousin, the yellow-wattled lapwing (*Sarcophorus malabaricus*). This latter, however, has a yellow wattle and one syllable less in its cry.

The Did-he-do-it is a bird which frequents open plains in the neighbourhood of water. I have never seen it perched on a tree, and as it does not possess the luxury of a hind toe, I imagine that, like the old lady after a rough Channel crossing, it likes to feel itself on "*terra cotta*."

This bird is not likely to be seen within municipal limits, but it is fairly abundant outside Madras. It feeds chiefly upon insects and small crustacea. It is not a gluttonous fowl. "Eha" declares that you never find it where there is food and that it does without sleep, since you never catch it napping. Jerdon, however, informs us that in the South of India it is said to sleep on its back with its legs in the air—a distinctly undignified position for a dandy. It sleeps thus so as to be able to catch on its toes the sky in case this should happen to fall down. As "Eha" says, the chief point about this truly native yarn is that it is impossible to contradict it, for who has seen a lapwing asleep?

The nesting habits of the Did-he-do-it are most interesting. Strictly speaking, it does not build a nest. It scrapes a cavity, about a quarter of an inch deep, in some stony place. This is the nest. Round it there are a few pieces of *kankar* or some twigs;

whether these are brought thither by the bird, or have merely been brushed there in the making of the cavity, I know not. Very frequently the nest is situated in the ballast of the railway line. Sometimes it is so placed that the footboard of every carriage passes over the head of the sitting bird. There is no accounting for tastes! Four eggs are usually laid; they are much more pointed at one end than at the other, and are invariably placed in the nest so as to form a star, the blunt ends projecting outwards and the thin ends nearly meeting at the centre.

Lapwings' eggs are protectively coloured. Being laid in the open and not hidden away in a nest, it is important that they should not be conspicuous, otherwise they would soon be espied and devoured by some egg-eating creature. Thus they are coloured so as to assimilate with their surroundings. The ground colour is greenish and is boldly splotched with sepia, some of the splotches being darker than others. The eggs are dull and not glossy, hence are very difficult to distinguish from the stones which lie round about them. From the above description it will be seen that the Did-he-do-it's egg is very like that of his cousin the English plover, whose eggs are held to be so great a delicacy. Why these eggs are so much esteemed I do not know. I suspect that it is because they are difficult to find, and so costly. If tripe and onions cost fifty shillings a pound, this dish would probably form the *pièce de résistance* of every millionaire's banquet.

The eggs of the Did-he-do-it, then, are interesting as forming perfect examples of protectively coloured

objects. As I have previously remarked, the theory of protective colouration has my deepest sympathy. It is an unfortunate jade upon which every biologist seems to think that he is entitled to take free rides ; the result is that the poor beast's ribs are cutting through its skin ! For example, every bird's egg is supposed to be protectively coloured—even the gorgeous shining blue egg laid by the seven sisters, which is, in truth, about as much protectively coloured as the I Zingari Cricket Club blazer is. The majority of eggs are laid in nests which are either covered in or more or less well concealed among foliage, hence there is no necessity for them to be protectively coloured. Dame Nature is free to exercise on them to the uttermost her artistic temperament, with the result that there are few things more beautiful than a collection of birds' eggs.

So well do the eggs of the lapwing assimilate with their surroundings, that, if you would discover a clutch of them, your only chance is to watch the actions of the possessors of the nest. But the Did-he-do-it is a wily bird, and if you are not very cute he will live up to his name by "doing you in the eye." He does not, like babblers and bulbuls, make a tremendous noise as you approach the nest. He assumes a nonchalant, I might say jaunty, air, hoping thereby to put the intruder off the scent. The other day I had the pleasure of circumventing a couple of lapwings. Feeling tolerably certain that a pair had a nest on a flat piece of ground near a canal bank, I determined to find that nest. My wife accompanied me. On arriving at the spot we took cover under some trees and scanned the horizon with

field-glasses, but saw no trace of a lapwing. I began to think I had made a mistake. After a time we walked on towards the canal; when we had gone some three hundred yards my wife noticed a bird on a ridge by the canal. By the aid of glasses I saw it was a Did-he-do-it. We both dropped down and watched. The bird had "spotted" us, for he had assumed the air of an old sailor who is smoking a pipe over a mug of beer, the air of a man without a care in the world. Presently he quietly disappeared behind the little ridge. We then made a big detour so as to reach the other side of this. Having arrived there we sat behind a tree. The lapwing was now eyeing us suspiciously. We affected to take no notice of him. Presently a second Did-he-do-it came out from behind a clump of low plants only to disappear into it almost immediately, and then ostentatiously reappear after a few seconds. Had we not known the wiles of the lapwing we should have located the nest behind that clump. But we knew better and waited. One of the birds again disappeared behind the clump, but emerged at the other side and strolled along very slowly; presently it came to some stones, where it stood motionless for a few seconds. It then sat down, or rather slowly sank into a sitting position. There was no doubt that the bird was now on the nest. We made for it. As we approached, the bird that was not on the nest flew off, making a noise with the object of putting us off the scent. The lapwing on the nest quietly got up and strolled off without a sound. On arriving at the place where she had been sitting we found three eggs. I took one of them for a lady who was

anxious to have one. Meanwhile both birds had flown away without making any noise. Having examined the nest, we returned to our watching place. In about ten minutes the bird was again sitting quite happily. She had not missed the egg.

COBBLER OR TAILOR?

THE disagreement between the popular and the scientific name of the tailor-bird (*Orthotomus sutorius*) must, I suppose, be attributed to the fact that the average ornithologist is not learned in the Classics. I freely admit that I did not notice the discrepancy until it was pointed out to me. *Orthotomus sutorius* means, not the tailoring, but the cobbling *Orthotomus*. It was, I believe, Forester who, considerably over a century ago, gave the bird the specific name which it now possesses, or rather the allied name, *sutoria*. If he wrote this in mistake for *sartoria*, the error was a stroke of genius, since the bird should certainly be called the cobbler rather than the tailor. The so-called sewing of the nest is undoubtedly a great performance for a little bird that does not possess a workbox. Nevertheless, if the *dirzie* who squats in the verandah did not work more neatly than the tailor-bird he would soon lose his place. *Orthotomus sutorius* does not sew leaves one to another, it merely cobbles them together, much as the "boy" cobbles together the holes in his master's socks.

When last I wrote about the tailor-bird, I had honestly to admit that I did not know how the bird did its work.

My attitude towards its sewing was then that of the child who sings—

Twinkle, twinkle, little star,
How I wonder what you are !

To-day I can boast with the learned astronomer—

• Twinkle, twinkle, little star,
Now we all know what you are !

for I have found out how the bird does its sewing.

Some months ago Mr. G. A. Pinto, a very keen ornithologist, informed me that a tailor-bird built regularly every year in the verandah in front of his drawing-room window. He told me that he had never thought of watching the stitching operation, and was much surprised when I informed him that, so far as I knew, no one had ever observed the complete process. He said that as the bird would undoubtedly begin building shortly, he would follow the whole process from the other side of the window. He was as good as his word. It is thanks to his patient watching that I am in a position to pen this article. Towards the end of May the hen tailor-bird began "prospecting" for a likely site, for the hen alone works at the nest, and selected a *Dracæna* plant on the left-hand side of the entrance to the verandah. One of the leaves of the plant was so curved that its terminal half was parallel with the ground. Upon this she commenced operations. The first thing she did was to make with her sharp little beak a number of punctures along each edge of the leaf. In this particular case the punctures took the form of longitudinal slits, owing to the fact that the veins of the

Dracæna leaf run longitudinally. In leaves of different texture the punctures take other shapes. Having thus prepared the leaf, she disappeared for a little and returned with a strand of cobweb. One end of this she wound round the narrow part of the leaf that separated one of the punctures from the edge ; having done this, she carried the loose end of the strand across the under surface of the leaf to a puncture on the opposite side, where she attached it to the leaf and thus drew the edges a little way together. She then proceeded to connect most of the other punctures with those opposite to them, so that the leaf took the form of a tunnel converging to a point. The under surface of the leaf formed the roof and sides of the tunnel or arch. There was no floor to this, since the edges of the leaf did not meet below, the gap between them being bridged by strands of cobweb. This was a full day's work for the little bird, and more than sufficient to disqualify her for membership in any trade union.

She next went on to line with cotton this *cul-de-sac* which she had made in the leaf. She, of course, commenced by filling the tip, and the weight of the lining soon caused the hitherto horizontal leaf to hang downwards, so that it eventually became almost vertical, with the tip pointing towards the ground. When lining the nest the bird made a number of punctures in the leaf, through which she poked the lining with her beak, the object of this being to keep the lining *in situ*. It was Mr. Pinto who first called my attention to these punctures in the body of the leaf. He informed me that he had never seen a tailor-bird's nest in which the lining

did not thus project through holes in the leaf, and that when searching for such nests he always looked out for this. My subsequent observations have tended to confirm his statement.

All this time the edges of the leaf that formed the nest had been held together by the thinnest strands of cobweb, and it is a mystery how these can have stood the strain. However, before the lining was completed, the bird proceeded to strengthen them by connecting the punctures on opposite edges of the leaf with threads of cotton. Her *modus operandi* was to push one end of a thread through a puncture on one edge and the other end through a puncture on the opposite edge of the leaf. The cotton used is soft and frays easily, so that that part of it which is forced through a tiny aperture issues as a fluffy knob, which looks like a knot and is usually taken for such. As a matter of fact, the bird makes no knots; she merely forces a portion of the cotton strand through a puncture, and the silicon which enters into the composition of the leaf catches the soft, minute strands of the cotton and prevents them from slipping.

Every one must have noticed how brittle a dead leaf is. This brittleness is due to the silicon which is deposited in the epidermis of the leaf. When the leaf is green the silicon is not so obvious; it is nevertheless there. Some leaves take up more silicon than others; grasses, for example, contain so much that many will cut one's hand if roughly plucked. I imagine that the tailor-bird usually selects for her nest a leaf or leaves in which there is plenty of silicon. Thus the bird does not make a knot

as is popularly supposed, nor is there any necessity for her to do so. Sometimes the connecting threads of cotton are sufficiently long to admit of their being passed to and fro, in which case the bird utilises the full length.

I may mention that when the nest, the building of which I have attempted to describe, was about three parts finished, Mr. Pinto noticed that the bird had ceased to work at it. He was surprised and disappointed. He then discovered that the little builder was at work on a *Dracæna* plant on the right-hand side of the entrance to the verandah, not two yards distant from the first nest. He was much astonished at the strange behaviour of the bird, and still more so when, the next day, she had resumed work at her first nest, which she completed, leaving the second unfinished at the stage when the punctures had been made and the edges of the leaf drawn together by strands of cobweb. Presently an explanation of the bird's unusual behaviour occurred to him. His dog which, ordinarily, is chained up at one end of the verandah, was, on the day the tailor-bird left her first nest, fastened up in the middle of the verandah, so that the bird while working at her nest would be within its reach. She evidently objected to this, so began a new nest; but next day, when the dog had been removed, she returned to her more advanced nursery. This accident of chaining up the dog for one day in the middle of the verandah was particularly fortunate, for it enabled me to examine carefully a nest in an early state of construction.

This account must, I fear, close with a tragedy.

When the little cobbler had been sitting on her eggs for about ten days one of the garden coolies broke them, out of mischief, and thought he had done a clever thing. He is now a sadder if not a wiser rascal !

A CROW IN COLOURS

From bough to bough the restless magpie roves,
And chatters as she flies.

THE magpie has been well called a crow in gay attire. The two species are related, and, as regards character, they are "birds of a feather." Both are bold, bad creatures, both rogues, thieves, and villains, and, as such, both appeal to me. The magpie with which we are familiar in England can scarcely be called an Indian bird. It does disport itself in happy Kashmir, and has been seen in the uninviting tract of land over which the Khan of Khelat presides. But India, as defined in the Income Tax Act, extends neither to Kashmir nor to Baluchistan, hence *Pica rustica* may decline to be considered an Indian subject. In this land of many trials his place is taken by his cousins the tree-pies. One of these—the Indian tree-pie (*Dendrocitta rufa*)—is distributed throughout the plains of India, at least, so the books tell us. As a matter of fact, I have never seen the bird in or about Madras. This is curious, for Madras is a garden city (I speak not of Georgetown), and the bird ought to revel in the well-wooded compounds which beautify the capital of the Southern Presidency. Lest its absence from Madras

be attributed to the profession tax, let me say that the best legal authorities are of opinion that the bird would not be liable to pay the tax. Not that it would make any difference if the bird were liable. If I know him aright, he would say to the importunate tax collector, "Go and get your hair cut," or words to that effect. Nor is there, so far as I can see, anything in the much-abused climate of Madras to frighten away the bird. Perhaps the doves are too much for him. If there be one thing more than another calculated to disturb the easily upset equilibrium of the gentle dove it is the sight of a tree-pie. In those places where it occurs you may, any day of the week, see one of these long-tailed rascals being pursued and buffeted by a pair of irate and hysterically screaming doves. In this particular case the doves have some excuse for their anger. The tree-pie, or the Indian magpie as Jerdon calls him, is, to use a colloquialism, dead-nuts on a new-laid egg for his breakfast, and, as doves always display their oological productions on a shakedown in a tree, and as I defy even a museum ornithologist to discover any trace of protective colouration about the aforesaid oological treasures, we cannot be surprised if the tree-pie thinks that doves lay eggs for his especial benefit. Even if the tree-pie does not happen to have been breakfasting off their eggs the doves have ample excuse for chastising him, for does not tradition tell us that Noah's curse is upon the bird? The rascal flatly refused to enter the Ark with the other birds, so that the Patriarch had actually to send Japhet to catch it!

Unfortunately, the tree-pie does not draw the line

at eggs. It is said that it makes no bones about devouring a young bird. I have never seen the creature commit this enormity, but Jerdon is my authority for the fact that "Mr. Smith" has known a bird to enter a covered verandah of a house and nip off half a dozen young geraniums, visit a cage of small birds, begin by stealing the grain, and end by killing and eating the birds, and repeating these visits daily until destroyed.

Facilis est descensus Averni.

This is only one side of the bird's character. I have seen a tree-pie literally obey the Biblical doctrine of turning the smitten cheek to the smiter; nor, so far as I know, did it, like the well-brought-up boy, after having allowed its second cheek to be smitten, take off its coat and thrash the smiter. The bird in question sat motionless on a branch with a seraphic smile on its face, and appeared to be ignorant of the fact that two little furies, in the shape of fantailed flycatchers, were making puny pecks at its plumage.

But before discoursing further upon the merits and demerits of our crow in colours, let me describe him. What applies to him applies to her. To the human eye there is no external difference between the two sexes. This by way of introduction. The tree-pie is a foot and a half long, one foot being tail and the remaining inches body. The head, neck, and breast are sooty brown, and the greater part of the remaining plumage is reddish fawn. The wings are brown and silver-grey. The tail is ashy grey broadly tipped with black. It is impossible to mistake a tree-pie; there is no other bird like it. Its flight is very characteristic, consisting of half

a dozen rapid flaps of the wing followed by a little sail. The two middle tail feathers are much longer than the others, the pair next to the middle ones are the second longest, and the outer ones shortest of all. The bird, like all others, spreads out its tail during flight, and the expanded tail gives it a curious appearance.

The Indian tree-pie, as its name implies, dwells principally in trees, and spends most of its time in picking insects off the leaves and branches. When fruit is in season, it feeds largely on that. It moves with great agility from branch to branch, but it frequently descends to the ground to feed and drink. It does not, I think, ever accompany cattle, as does our poor, persecuted magpie at home. It is a sociable bird and is frequently seen in little companies of six or seven.

Like all socially inclined birds, it is very conversational. It has a great variety of notes, many of which are harsh and angry-sounding, others are whistling, metallic calls, acceptable to the human ear. The commonest of these sounds something like *coch-lee, coch-lee*. If, in a place where magpies abound, you hear any new and strange cry, you are tolerably safe in attributing it to one of those birds.

The Indian pie is not so expert a nest-builder as its European cousin. This latter, it will be remembered, builds a large domed structure of prickly twigs with an entrance at one side, well protected by thorns. I have not been able to discover why this bird is at such pains to protect the entrance to its nursery. It is so aggressive and pugnacious that no sane thing in feathers

would dream of attempting to rob its nest. One ornithologist has put forth the brilliant suggestion that the protection is against its brother magpies. I cannot accept this, for I take it as an axiom that where one magpie can enter, there can another. We must also bear in mind that the Indian species manage to thrive very well in spite of their roofless nests.

UP-TO-DATE SPECIES MAKING

THE ornithological world is peopled by two classes of human beings. There are those who study nature inside the museum with the microscope and the scalpel; and there are those who love to observe birds in the open and study their habits. The former, if kept in their place, perform a very useful function, for they co-ordinate and elaborate the observations of the field naturalist. They should be most useful servants to him. Unfortunately these museum men are growing very powerful, and, like trade unions, are beginning to dictate to their masters. Indeed, they bid fair to become the masters and turn the field naturalists into their slaves. The chief aim of the arm-chair or museum ornithologist appears to be the multiplication of new species. Nowadays more species seem to be brought into being by these men than by natural selection. When they are not manufacturing new species, they are tampering with those that already exist.

I have repeatedly had occasion to speak of the marvellous, kaleidoscopic changes undergone by ornithological terminology—changes which are the despair of the field naturalist. I am not a statistician, but at a rough guess I should say that every species of bird has its name

changed about once in each decade. The object of having a classical terminology is that naturalists of all countries shall have a common name for every bird and beast, and thus not be at cross-purposes when conversing or corresponding. But this object is most successfully defeated when the classical name is continually undergoing alteration. It is practically impossible for any one but the professional ornithologist to keep pace with these changes. A poor dilettante like myself has not a look in. For example, I received by the last mail* the latest issue of the Avicultural Society's Magazine and noticed in it an article on the collared turtle-dove of Burma. Wondering what this bird might be, I looked at its scientific name and found it to be *Turtur decaocta*. I looked this up in both Jerdon and the *Fauna of British India*, but could not find it; nor could I see any mention of the collared turtle-dove. On reading through the paper I found, to my astonishment, that the bird referred to was our familiar friend the common or garden Indian ring-dove, which for years has been called *Turtur risorius*. *Risorius* was a name good enough for Jerdon, Hume, Vidal, Legge, Barnes, Reid, Davison, and a hundred other good ornithologists; but because, forsooth, one Salvadori would like a change, we shall, I suppose, be obliged to adopt the latest new-fangled appellation.

The museum ornithologist has yet another craze. He sees that there must be some limit to the present multiplication of species, so he has hit upon the brilliant idea of making sub-species. Just as the inhabitants of

* Written towards the end of 1906.

every town and village have little local peculiarities, so have birds of the same species which live in different provinces. The latest idea is to make each of these a different sub-species with a special name of its own. In the near future the scientific name of every bird will be composed of three parts, the generic, the specific, and the sub-specific. Thus Mr. T. H. Newman has discovered that the skin round the eye of the ring-dove of Burma is not whitish, as it is in India, but yellow; Mr. Newman therefore manufactures a new sub-species, which he calls *Turtur decaocto xanthocyclus* as opposed to the Indian bird which he calls *Turtur decaocto douraca*. We may consider ourselves lucky that he has not made a new species of the Burmese bird!

This is not an isolated case. Almost every unfortunate species in the universe is being split up into a dozen or more sub-species. Any local variation in the colour of the plumage is considered sufficient justification for the formation of a sub-species, and we shall undoubtedly, ere long, hear of sub-sub-species!!

The hopeless thing is that any Juggins can make new sub-species. It is as easy as falling out of a tree. Let me show how it is done. Take the common sparrow. This pushing little bird, this "feathered Hooligan," as Mr. Finn calls him, is found all over the world, and every one is able to recognise the sparrow wherever he meets him as the same bird that insults people in London. But the sparrows of each country have their little peculiarities. For example, the cock sparrow in India has more white on his neck than his brother in

England. Hence we may make a sub-species of the Indian bird and call him *Passer domesticus indicus*.

Now, close and patient observation during a prolonged sojourn in Madras has convinced me that the sparrow in the Southern Presidency (I will no longer call it the Benighted Presidency, for experience has shown me that there are other parts of India far more benighted) is quite twenty per cent. more impudent than the sparrows in Northern India. Hence we have no option but to make a sub-sub-species of him. Let us call him *Passer domesticus indicus maderaspatensis*. We may go even a step further. The sparrows that hold chorus along the ledges of the iron rafters of the Connemara Hotel are far more insulting and exasperating than any other sparrows I have set eyes upon. This surely is quite sufficient provocation for making a sub-sub-sub-species of those birds. I propose to call them *Passer domesticus indicus maderaspatensis connemara hotelwalla*—a name which I am sure will be received with acclamation both by sparrows and human beings.

But enough of this foolery. The multiplication of species is really a very serious matter, for it is likely to deter sane persons from taking up the most delightful of studies. If the ornithological societies of every country in the world would combine to suppress the evil, it could easily be put down. But there is, I fear, no likelihood of such combination, because these societies are composed mostly of museum ornithologists, and it is too much to expect of these men that they will voluntarily suppress their chief enjoyment in life. To persuade them to act in this altruistic manner it will be

necessary to offer them a *quid pro quo*. The only *quid* that suggests itself to me is to invite each of them to name a bird after himself. Let the name of every known species (I mean proper and indisputable species) be put in a hat and let each member draw one out. The bird he draws will henceforth be called after him. If any birds are left undrawn after every man has shed his name on one species, the remainder could be balloted for, and thus some lucky dogs would be able to give their name to two birds. When this is once done, it should be made an offence punishable with death to change the specific name of any feathered thing. Newly discovered birds and beasts could, as heretofore, be named after the happy discoverer. This proposal will, if adopted, cure the evil. My point is that it does not matter a jot what a bird be called ; the important thing is to give it a fixed and immutable name, so that we poor field naturalists shall know where we are.

HONEYSUCKERS.

HONEYSUCKERS are birds that have adopted the manner of living of the butterfly, and a charming mode of life it is. To flit about in the sunshine and drink sweet draughts of the nectar that lies hidden away at the base of the petals of flowers is indeed an idyllic existence.

The sunbird, as the honeysucker is frequently called, is provided with a curved beak and a long tubular tongue to enable it the better to rob cup-like blossoms of their honey. The bird must perforce be very small and light, or it would find it impossible to reach the nectar of many flowers. As a matter of fact, it is almost as light as air, so is able to support itself on one flower when drinking honey from another. Sometimes, if no perch be available, the little honeysucker will hover in the air on rapidly vibrating wings and thus extract the sweets from a flower. In this attitude it looks very like a butterfly. I may here mention that sunbirds do not live exclusively upon honey: they vary this diet with minute insects which they pick off flowers and leaves.

Honeysuckers are frequently called humming-birds by Anglo-Indians. This is not correct. Humming-birds are confined to the New World, and are smaller



LOREN'S SUNBIRD. (ARACHNECITHRA LOLENIA)
(Note the long curved bill adapted to insertion in flowers.)

and more ethereal than our little honeysuckers, but their methods of feeding are so similar that the mistake is a pardonable one.

As every one knows, butterflies and bees, in return for the honey they receive, render service to the flowers by carrying the pollen from the stamen of one to the stigma of the other and thus bring about cross-fertilisation, which most botanists believe to be essential to the well-being of a species. Honeysuckers probably perform a similar service, for, as they flit from flower to flower, their little heads may be seen to be well dusted with yellow pollen.

Sunbirds are found all over India, but they are most plentiful in the South, being essentially tropical birds; they are merely summer visitors to the Punjab; when the short, cold winter days come, they leave that province and betake themselves to some milder clime.

Three species may be seen in our Madras gardens—Loten's, the purple, and the yellow honeysucker.

Of the cocks of the first and second species (*Arachnechthra lotenia* and *A. asiatica*) it may perhaps be said that they are clothed in purple and fine linen, for their plumage is a deep, rich purple with a sheen and a gloss like that on a brand-new silk hat. Sometimes the bird looks black, at others green, and more frequently mauve, according to the intensity of the light and the angle at which the sun's rays fall upon it. It is not very easy to distinguish between these two sunbirds unless specimens are held in the hand, when the violet-black abdomen of the purple species can be easily distinguished from the snuff-brown lower parts of

Loten's. However, the latter has a much longer and stouter beak, and is very abundant in Madras, while the purple bird is comparatively rare, so that the Madrassi is fairly safe in setting down all the purple birds he sees as Loten's honeysuckers. If, however, he espies a purple sunbird, with an unusually short bill, a bird that sings like a canary, he may be certain that that particular one is *A. asiatica*. If the cock Loten's sunbird is clothed in purple and fine linen, that of the yellow species (*A. zeylonica*) may be said to be arrayed in a coat of many colours, each of which is so beautiful as to defy imitation by the painter. There is a patch on the crown which appears metallic lilac in some lights and emerald-green in others. His neck and upper back are dull crimson, the lower back, chin, and throat are brilliant metallic purple. The tail and wing feathers are dark brown. There is a maroon collar below the throat, and the plumage from this collar downwards is bright yellow. Verily, Solomon in all his glory was not arrayed like one of these.

The hens of all three species are homely-looking birds, difficult to distinguish one from the other. The upper plumage of each is dingy brown and the lower parts dull yellow. Many ornithologists declare that sexual dimorphism, such as is here displayed, is due to the greater need of the hen for protection when sitting on the eggs. These people allege that if the hens of brightly plumaged species were as showy as the cocks, they would be conspicuous objects when brooding, and so fall easy victims to birds of prey. This is a theory typical of the arm-chair naturalist, or of him who studies



THE YELLOW SUNBIRD. (*ARACHNEOTHIRA ZEALONICA*)

nature through the grimy panes of a museum window. Like all such theories, it is tempting at first sight, but is untenable because it fails to take cognisance of facts with which every field-naturalist should be acquainted. In the first place, birds of prey rarely attack stationary objects : they look out for moving quarry. Secondly, the cock of many species, such as the paradise flycatcher (*Terpsiphone paradisi*), although he is far more showy than the hen, sits on the eggs in the open nest quite as much as she does. In this case what is sauce for the goose is sauce for the gander ; if she needs protective colouring, so does he. It is true that the cock sunbird never takes a turn on the nest ; he is not a family man, but a gay young spark, who goes about bravely attired, with his hand upon the handle of his sword, ready to draw it upon the least provocation. A more pugnacious little bird does not exist. While the hen is laboriously building the wonderful little nest, he spends his time in drinking and revelry, with an occasional visit to the growing nursery to criticise its construction. Hence it might seem that, in the case of the sunbird, the above-mentioned explanation of the sexual dimorphism is the true one. Unfortunately, the nest is not an open one, but a little mango-shaped structure with an entrance at the side, so that the hen when sitting in it is not visible from above. In this case, therefore, as in so many others, we must seek a new explanation of this difference in the appearance of the cocks and hens.

The nest is in shape and size like a mango. It hangs down from the end of a branch, or any other convenient object. It is composed of dried grass,

leaves, cocoons, bits of paper, and any kind of rubbish, held together by means of cobweb and some glutinous substance. There is an entrance at the side, over which is a little porch that serves to keep out rain and sun, but this porch is seen in every nest, even when the bird builds, as it very frequently does, in a verandah. A sunbird recently made its nest in the verandah of a friend of mine ; the latter came to me and expressed his contempt for the intellect of the little architect, since she had been fool enough to construct a porch, although the nest was built under cover. He forgot that the building of nests is largely an instinctive act, that each bird builds on a fixed plan, learned by it in "the school of the woods."

The nest is cosily lined with cotton down. No attempt is made to conceal it ; nevertheless it frequently escapes the notice of human beings, because it does not look like a nest ; one is apt to mistake it for a mass of dried grass and rubbish that has become caught in a branch. A sunbird in my compound completely covered her nest with the paper shavings that had once formed the packing for a tin of biscuits. The *khansamah*, when opening the tin, had, after the manner of his kind, pitched the shavings out of the window of the cook-house.

It is doubtful whether predaceous creatures mistake the sunbird's nest for a mass of rubbish ; but it is so well placed that they cannot get at it. It is invariably situated sufficiently far above the ground to be out of reach of a four-legged animal ; it hangs from an outstanding branch so that no crow or kite can get a



NEST OF LOTEN'S SUNBIRD
(Notice that it is built in a spider's web)

foothold anywhere near it, and the squirrel who ventured to trust himself on to the nest would, I believe, look very foolish when attacked by the owners.

As is usually the case with birds that build covered nests, the hen is not at all shy. If her nursery happens to be in a verandah, she will sit in it with her head out of the window, and watch with interest the owners of the bungalow taking afternoon tea three feet below her.

A HEWER OF WOOD

NOT the least of the many benefits which birds confer upon man is the unceasing warfare which the majority of them wage upon insects. Insects may be said to dominate the earth ; they fill every nook and cranny of it, preying upon all other living things which they outnumber. If this is the state of affairs when hundreds of millions of insects are devoured daily by their arch-foes, the fowls of the air, what would it be were there no birds ? The earth would certainly not be inhabited by men.

Most insectivorous birds specialise, that is to say, lay themselves out to catch a particular class of insect. Swifts, swallows, and flycatchers have developed phenomenal mastery over the air, so prey upon flying insects. Mynas, hoopoes, "blue jays," magpie-robbins, and others feed upon the hexapod hosts that crawl on the ground. Not a few birds confine their attention to the creeping things that inhabit the bark of trees. Such are the wryneck, the tree-creeper, and the woodpecker. Of these the woodpecker is chief. A mighty insect hunter is he, one who tracks down his quarry and drags him out of his lair. How must the insects which lie hidden away in the crevices of the bark tremble as they hear

this feathered Nimrod battering at the walls of their citadel!

No bird is better adapted than the woodpecker to the work which nature has given him. He is a perfect hunting machine, constructed for work in trees. Note the ease with which he moves over the upright trunk. His sharp claws can obtain a foothold on almost any surface. I have seen a golden-backed woodpecker hunting insects on a smooth well-wheel!

His tail, which is short and composed of very stiff feathers, acts almost like a third leg. The bristle-like feathers stick in the crevices of the bark and enable the bird to maintain his position while he hammers away with might and main. His head is his hammer and his beak his chisel. The chisel is fixed rigidly in the hammer so that none of the force of the blow is lost. It is exhilarating to watch a woodpecker at work. He stands with his legs wide apart, the tip of his tail pressed firmly against the bark, and puts all he knows into each stroke, drawing his head back as far as it will go and then letting drive. The manner in which his strokes follow one another puts me in mind of the clever way in which workmen drive an iron bar into a macadamised road by raining upon it blows with sledge-hammers. Almost before the hammer of the first striker is off the head of the bar the second has struck it, this is immediately followed by the hammer of the third, then, without a pause, the first hammerer gets his second blow home, and so they continue until a halt is called. As a small boy I would stand for hours watching the operation. I am ashamed to do so now, so

have to content myself with observing woodpeckers at work! There are few things more fascinating to watch than an operation in which skill and brute force are deftly combined.

Even more useful than the beak as a weapon is the woodpecker's tongue. This is such an important organ that its owner is known in some parts of England as the tongue bird. It is so long that there is a special apparatus at the back of the bird's head for stowing it away. Its surface is studded with backwardly pointing bristles and the whole covered with sticky saliva. When the woodpecker espies a crack in the bark it inserts into it the long ribbon-like tongue. To this the luckless insects stick and are ruthlessly dragged out to their doom.

The commonest woodpecker in India is the beautiful golden-backed species (*Brachypternus aurantius*). The head and crest of the cock are bright crimson, the upper back is a beautiful golden yellow, hence the popular name of the bird. The lower back and tail are black; the wing feathers are black and golden yellow, spotted with white, and the sides of the head show a white background on which there is a network of black lines and streaks.

The hen differs from the cock in having the top of the head black with small white triangular spots.

The golden-backed woodpecker is one of our noisiest birds. It constantly utters its loud screaming call, which is similar to that of the white-breasted kingfisher. Its flight, like that of most, if not all woodpeckers, is laborious and noisy, the whir of its wings being audible at a

considerable distance. The bird gives one or two vigorous flaps of its wings and thus moves in an upward direction, then it sails and sinks; a few more flaps again send it upwards, and so it continues until it reaches the tree trunk for which it is bound.

I do not think that the woodpecker ever takes a sustained flight. It is seen at its best when on the stem of a tree, over which it moves with wonderful ease in a series of silent jerks, like a mechanical toy. It always keeps its head pointing heavenwards and hops or jerks itself upwards, downwards, or sideways, with equal ease, just as though it went by clockwork. It sometimes ventures on the ground, from which it digs out insects. On the earth it progresses in the same jerky manner.

I have never seen a woodpecker sitting like an ordinary bird on a perch. It is often seen on branches, but always lengthwise, never sitting across the branch. It can move along the under surface of a horizontal bough as easily as a fly walks on the ceiling.

I sometimes wonder how woodpeckers roost. Do they sleep hanging on to the trunk of some tree, do they sit lengthwise on a branch as a nightjar does, or do they repair to some hole? I should be inclined to favour the last of these alternatives but for the fact that woodpeckers seem to excavate a new nest every year. This would not be necessary if each bird had a hole in which it slept at night.

Sometimes the bird digs out the whole of its nest, but this is not usual. The woodpecker belongs to the "labouring classes," and, true to the traditions of its caste, it is averse to work, so generally utilises a ready-

made cavity. It taps away at tree after tree until it comes upon a place in a trunk that sounds hollow ; it then proceeds to excavate a neat, round passage leading to this hollow. In this ready-made cavity it deposits its white eggs, not troubling to add any lining to the nesting chamber.

Woodpeckers in England suffer much at the hands of rascally starlings. These latter nest in holes, but not of their own making. If they cannot find any ready-made hollow they listen for the hammering of a woodpecker. They wait until he has completed the nest, and then take possession while his back is turned. When the rightful owner returns the starling looks out of the entrance with finely simulated indignation and asks the woodpecker what he means by intruding. In vain does the latter expostulate. *J'y suis, j'y reste* is the attitude of the starling. The result is that our feathered carpenter, not being over-valorous, retires and proceeds to hew out another nest. Woodpeckers in India do not suffer such treatment, for starlings do not breed in this country. Their cousins, the mynas, are not so impudent. The only Indian birds which nest in holes, and have sufficient impudence to eject a woodpecker, are the green parrots ; but these breed in January, so that their family cares for the year are over long before the wood-pecker begins nest building.

A FEATHERED SPRINTERS

WHICH is the most difficult bird to shoot? You may put this question to a dozen sportsmen; probably no two will name the same bird, and each will be able to give excellent reasons why the particular fowl he mentions is the hardest to hit. The reason for this diversity of opinion is simply that there exists no bird more difficult to shoot than all others. Even as beauty is said to be in the eye of the beholder, so does the difficulty, or otherwise, of shooting any particular species depend upon the idiosyncrasies of the would-be slayer. To some shooters all birds, with the possible exception of the coot, are difficult to bring down, while others are able to make every flying thing appear an easy mark.

To my way of thinking the chukor (*Caccabis chucar*) takes a lot of hitting, but this species receives much help on account of its mountainous habitat. It is difficult to hit even a hoary old peacock if the bird gets up when you, already pumped to exhaustion by a stiff climb, are engaged in scrambling from one terraced field to another with your gun at "safe." The chukor, thanks to the fact, conclusively proved by our friend Euclid, that any two sides of a triangle are greater than the third, enjoys so great an advantage over the

wingless *shikari* that it would be a contemptible creature were it not difficult to shoot. Were I the leader of a covey of chukor, I should thoroughly enjoy an attempt to shoot me. Having taken up a strategic position near the summit of a steep hill, I should squat there in full view until the sportsman had by laborious effort climbed to a spot some hundred and twenty yards from where I was sitting ; I should then gracefully retire with my retinue across the *khud* to the opposite hill, and watch with interest the shooter clamber down one limb of an isosceles triangle and swarm up the other. Some time before he had completed the operation I should again proceed to give him a practical demonstration of the fact that the base of certain triangles is considerably shorter than the sum of the other two sides.

If you take away from the chukor his natural advantages I am inclined to think that the grey partridge (*Francolinus pondicerianus*) is the more difficult bird to shoot. This species is common in most parts of India, yet I do not remember ever having heard of any one making a big bag of grey partridge. Some there are who say that the bird is not worth shooting. If these good folk mean that the shooting of the partridge involves so large an expenditure of ammunition as to deter them from the undertaking I am inclined to agree with them. Given a fair field in the shape of a plain well studded with prickly pear, there is, in my opinion, no bird more difficult to hit than the grey partridge. It is, like all game birds proper, a very rapid flier for a short distance. But it is not so much this which makes it hard to shoot as the rapidity with which it can run



LOPEN'S SUNBIRD (HEN) ABOUT TO ENTER NEST

along the ground and the close manner in which it lies up. According to Mr. Lockwood Kipling, the grey partridge, as it runs, "suggests a graceful girl tripping along with a full skirt well held up." In a sense the simile is a good one, for the lower plumage of the partridge is curiously "full," and so does make the bird look as though it were holding up its skirts. But until graceful young ladies are able to gather up their ample skirts and sprint the "hundred" two or three yards inside "level time," it will be inaccurate to compare the tripping gait of the one to the speedy motion of the other. The grey partridge is a winged sprinter, a feathered Camilla. It can for a short distance hold its own comfortably against a galloping horse. Frequently have I come upon a covey, feeding in the open and giving vent to the familiar call, and have immediately proceeded to stalk it in the hopes of obtaining a couple of good shots. Before getting within range, one of the birds invariably "spots" me and gives the alarm. The calling immediately ceases and the partridges walk briskly to cover. The instant they disappear I dash towards the cover, hoping to surprise and flush them, but they run three yards to my two, and by the time I reach the bushes into which they betook themselves they are laughing at me from afar.

Then the way in which a partridge will sometimes lie up in comparatively thin cover is remarkable. One day, when shooting snipe at sunrise, I surprised a partridge feeding in a field. I fired, but apparently did not hit the bird, for it disappeared into a clump of palm trees and prickly pear. Taking up a position close to

this clump, I instructed my beaters to throw stones into it. This they did, but half a dozen stones, to say nothing of as many chunks of clay and the most frantic yells and shouts, elicited no response from the partridge. I therefore moved on, and the moment I had turned my back on the clump the bird flew out! This is typical of my experience as a partridge shooter; the birds almost invariably get up from cover at a moment when I cannot possibly take a shot at them. Well might I sing with Cowper—

I stride o'er the stubble each day with my gun
Never ready to shoot till the covey is flown.

For these reasons partridge shooting is to me a particularly exasperating form of sport. There are few things more annoying than to hear—"the partridge burst away on whirring wings," from a bush on which you have just turned your back after having thrown into it half the contents of a ploughed field!

I am not a bloodthirsty individual, and enjoy watching birds through a field-glass quite as much as, if not more than, shooting them with a gun, but there is something in the call of the grey partridge which makes me want to shoot him. His shrill "pateela, pateela, pateela," seems to be a challenge. Grahame sings—

Cheerily
The partridge now her tuneless call repeats.

For "cheerily" write "cheekily" and you have a good description of the call of our Indian grey partridge, which may be heard in Madras every morning during the winter months.

This bird does not build an elaborate nest. There is no necessity for it to do so. A nest is a nursery in which young birds are for a time sheltered from the dangers that beset them in the world. When they have developed sufficiently to be able to look after themselves they leave the nest.

It is one of the characteristics of the gallinaceous family of birds, which includes grouse, poultry, pea- and guinea-fowl, pheasants, turkeys, and quail, that their young are able to run about almost immediately after issuing from the egg. They are born covered with down, and are thus at first very unlike their parents. They are in reality larvæ, that is to say, embryonic forms which are able to fend for themselves with little or no assistance from their parents. They change into the adult form, not hidden away in a nursery, but in the open world.

The nest, then, of the partridge is a very insignificant affair. It is usually a depression in the ground, so shallow as to be barely perceptible, and always well concealed in a bush or tuft of grass. Sometimes the eggs are laid on the bare soil, but more usually the depression is lined with grass or leaves. Occasionally the lining is so thick as to form a regular pad. From six to nine whitish eggs are laid. These do not match the ground or material on which they lie, hence cannot be considered as examples of protective colouring. Their safety depends on the fact that they are hidden away under a bush or tuft of grass. The hen, too, is a very close sitter, and her plumage assimilates well with the surroundings of the nest.

A BIRD OF CHARACTER

I HAVE hinted more than once at the possibility of there being some understanding between the architect of my bungalow and the feathered folk. On this hypothesis alone am I able to account for the presence of a rectangular hole in the porch, about eight feet above the level of the ground, a hole caused by the deliberate omission of one or two bricks. The scramble for this cavity by those species of birds which build in holes is as great as that of Europeans to secure bungalows in a Presidency town. Last year a pair of spotted owlets (*Athene brama*) secured the prize and reared up a noisy brood of four. These were regarded with mingled feelings by the human inhabitants of the bungalow. On the one hand, a bird more amusing than the clownish little owl does not exist, on the other, it is excessively noisy. Each member of the family talks gibberish at the top of its voice, sixteen to the dozen, and as all will persist in speaking at once, the result is a nocturnal chorus that will bear comparison with the efforts of the cats which enliven the Londoner's back yard.

This year a couple of mynas (*Acridotheres tristis*) secured the highly desirable nesting site. Immediately on entering into possession they proceeded to cover the



THE INDIAN SPOTTED OWLET (ATHENE BRAMA)

floor of the cavity with a collection of rubbish, composed chiefly of rags, grass, twigs, and bits of paper. There was no attempt at arranging this rubbish, it was bundled pell-mell into the hole and four pretty blue eggs were laid on top of it.

One might suppose that the more intelligent the bird the greater the degree of architectural skill it would display. This, however, is not the case. Were it so, crows, mynas, and parrots would build palatial nests.

Mynas do not always nestle in holes in buildings; they are content with any kind of a cavity, whether it be in a building, a tree, or a sandbank. In default of a hole they are content with a ledge, provided it be covered with a roof. A few years ago a pair of mynas reared up a brood on a ledge in the much-frequented verandah of the Deputy Commissioner's Court at Fyzabad.

To return to the nest in my porch. The eggs in due course gave rise to four nestlings of the ordinary ugly, triangular-mouthed, alderman-stomached variety. When they were nearly ready to leave the nest I took away two of them by way of rent for the use of my bungalow. This action was in complete accord with oriental custom. In India the landlord has, from time immemorial, taken from his tenants a portion of their produce as rent or land revenue. The Congress will doubtless declare that in levying 50 per cent. of the family brood I assessed the family too highly; but I defy even a Bengali orator to take 33 per cent. of four young mynas. I might, it is true, have assessed the rent at 25 per cent., but the life of a solitary myna cannot be a very happy one, so I took two, a cock and a hen.

To the ordinary observer the cock myna is as like the hen as one pea is like any other pea. To one, however, who has an eye for such things, the bigger head and more massive body of the cock render him easily recognisable when in company with his sisters. The brood consisted of two cocks and two hens, so that I made a fair division. Some there are who may question the ethics of my action. I would remind such that, incredible as it may seem, the parent birds, in all probability, did not miss the two young ones. Birds cannot count. Even the wily crow is unable to "spot" the extra egg which the koel has surreptitiously introduced into the nest. It is, of course, possible that although those mynas could not count, they missed the two young birds to the extent of noticing that something was wrong with their brood. If they did all I can say is that they concealed their feelings in an admirable manner, for they continued to feed the remaining young as though nothing had happened. If it be thought incredible that the young birds were not missed, is it not equally hard to believe that not one of the lower animals can tell the difference between two and three? If a dog has three bones before him and you remove one of them, he will not miss it unless he sees you remove it!

A *chaprassi* was appointed to nurse my two young mynas, with instructions to keep them until they should become somewhat more presentable. At the end of three weeks they were adjudged fit to appear in public, being somewhat smaller and rather lanky editions of their parents, with the patch behind the eye white instead of yellow. Having been taken from the nest they were

perfectly tame, showing no fear of man, and readily accepting food from the hand.

Young nestlings display no fear of man, and do not appear to mind being handled by a human being; but as they grow older they learn to fear all strange creatures, hence it is that captive birds taken from the nest are always tamer than those which are caught after they are fledged. It was amusing to see the way in which my young mynas ran towards the *chaprassi* when he called "Puppy, puppy." "Puppy" is apparently a term applied by native servants indiscriminately to any kind of pet kept by a *sahib*.

Mynas make excellent pets because they are so alert and vivacious, and, above all, because they have so much character.

A myna is a self-assertive bird, a bird that will stand no nonsense.

I know of few things more amusing than to witness a pair of mynas give a snake a bit of their minds as they waltz along beside it in a most daring manner.

Owing to the self-assertion of the myna he is apt to be quarrelsome.

Street brawls are, I regret to say, by no means uncommon. In these two or three mynas attack one another so fiercely that they get locked together and roll over and over—a swearing, struggling ball of brown, yellow, and white.

The myna, although by no means a songster, is able to emit a great variety of notes, all of which must be familiar to every Anglo-Indian.

A bird which can produce a large number of sounds

is almost invariably a good mimic, and the common myna is no exception to this rule. In this respect, however, he does not compare favourably with the grackles or hill-mynas, as they are commonly called. These can imitate any sound, from the crack of a whip and the exhortations of a bullock-cart driver to the throat-clearing operation in which our Indian brethren so frequently indulge.

SWIFTS

SWIFTS are extraordinary birds ; there are no others like unto them; they are the most mysterious of the many mysterious products of natural selection; their athletic feats transcend the descriptive powers of the English language. What adjective is there of suitable application to a bird that speeds through the air without an appreciable effort at the rate of a hundred miles an hour, that traverses a thousand miles every day of its existence?

These wonderful birds are everywhere common, yet much of their life history requires elucidation.

Probably not one man in fifty is able to distinguish between a swallow and a swift. Some think that "swift" and "swallow" are synonymous terms, while others believe that a swift is a kind of black swallow. As a matter of fact, the swift differs more widely from the swallow than the crow does from the canary. There is, it is true, a very strong professional likeness between the swift and the swallow, but this likeness is purely superficial ; it is merely the resemblance engendered by similar modes of obtaining a livelihood. Both swallows and swifts feed exclusively on minute insects which they catch upon the wing, hence both have a large gape, light, slender bodies, and long, powerful wings. But speedy though it be, the swallow is not in the same

class with the swift as a flyer. When both birds are in the hand nothing is easier than to tell a swift from a swallow or a martin. The latter have the ordinary passerine foot, which consists of three forwardly directed toes and a backwardly directed one. This foot enables a bird to perch, so that one frequently sees swallows seated on telegraph wires. But one never sees a swift on a perch, because all its four toes point forward. It cannot even walk. It spends its life in the air. It eats and drinks on the wing, it does everything, except sleeping and incubating, in the air.

But it is not often that one has a swallow or swift in the hand ; it is difficult to get near enough to them to put salt on the tail, so that it is necessary to have some means of distinguishing them when sailing through the air. There is a very marked difference in the manner in which these birds use their wings. This is inimitably described by Mr. E. H. Aitken : "As a swallow darts along, its wings almost close against its sides at every stroke, and it looks like a pair of scissors opening and shutting. Now a swift never closes its wings in this way. It whips the air rapidly with the points of them, but they are always extended and evenly curved from tip to tip like a bow, the slim body of the bird being the arrow." As a swift speeds through the air it looks something like an anchor, with a short shaft and enormous flukes. If this be borne in mind, it is scarcely possible to mistake a swift for a swallow. Swifts are abundant in Calcutta, but one is not likely to come across a swallow there except when the moon happens to be blue.

The two swifts commonly seen in Calcutta are the

Indian swift (*Cypselus affinis*) and the palm swift (*C. batassiensis*).

The latter need not detain us long. It is a small and weak edition of the former. It builds a cup-shaped nest on the under side of the great fan-like leaves of the toddy palm.

The Indian swift is, in size and appearance, much like the swift which visits England every summer, except for the fact that it has a white patch on the lower part of the back. The chin is white, but all the rest of the plumage, with the exception of the above-mentioned patch, is black or smoky brown.

This bird nests in colonies in the verandahs of houses and inside deserted buildings. The nest is a cup-shaped structure, usually built under an eave in the angle which a roof-beam makes with the wall. Thus the swift finds, ready-made, a roof and a couple of walls, and has merely to add the floor and remaining walls, in one of which it leaves a hole by way of entrance to the nursery. Thus the swift reverses the usual order of things, which is to erect a nest on some foundation such as a branch or ledge.

As we have seen, all four toes of the swift are forwardly directed and each is terminated by a sharp hook-like claw. Thus the swift is able to cling with ease to such a vertical surface as that of a wall, and is therefore quite independent of any ledge or perch. The nest is a conglomeration of grass, straw, and feathers, which are made to adhere to one another, and to the building to which the nest is attached, by the cement-like saliva of the bird.

Some species of swift build their homes entirely of their glutinous saliva, and so manufacture "edible birds' nests." The Indian swift, however, utilises all manner of material by way of economising its saliva.

Nest building is a slow process. Each tiny piece of material has to be separately stuck on to the structure, and the saliva, which is, of course, liquid when first secreted, takes about five minutes to dry. During the whole of this time the bird remains motionless, holding *in situ* whatever it is adding to the structure.

I once timed a pair of swifts at work, and found that on an average they took forty-five minutes in bringing each new piece of material. Much of this time was undoubtedly spent in seeking for food, for so active a bird as the swift must have an enormous appetite, and, as it feeds on the minutest of insects, must consume thousands of them in the course of the day, each of which has to be caught separately. But, even allowing for this, the rate at which the material is added is very slow. Some naturalists declare that the swift is unable to pick anything off the ground. If this be so, the labour of obtaining material must be great, for the creature must fly about until it espies a feather or piece of straw floating in the air.

I am not yet in a position to say whether it is really impossible for the bird to pick anything from off the ground. I have never seen it do so, and it is a fact that the birds will, when building, eagerly seize anything floating in the air. On the other hand, the helplessness of the swift when placed upon the ground has been much exaggerated. It is said that the bird, if put upon

a flat surface, is unable to rise and will remain there until it dies. Quite recently some Indian swifts were brought to me and I placed one of them on my desk. In less than twenty seconds the bird was flying about in the room. Then, again, the grasping powers of its hook-like claws have been somewhat magnified. The bird in question made several unsuccessful attempts to cling on to the whitewashed wall, and eventually fell to the floor, where it was seized and then liberated in the open. It flew off none the worse for its adventure. Nevertheless, its claws are very sharp; the bird in question stuck them quite unpleasantly into me when I held it. A swift can certainly cling to any vertical surface that is the least rough.

Unlike most birds, swifts use their nests as houses and sleep in them at night. One frequently hears issuing from the rafters in the dead of night the piercing scream so characteristic of swifts. This disposes of the silly story, so prevalent, that at evening time the swifts mount into the higher layers of the atmosphere and there sleep on the wing.

In conclusion, I must mention the characteristic flight of swifts just before sundown. The birds close the day in what has been called "a jubilant rout"; as if they had not already taken sufficient exercise, they fly at a breakneck pace round about the building in which their nests are placed, dodging in and out of the pillars of the verandah, and fill the air with their shivering screams. This seems to be a characteristic of swifts wherever they are found.

BIRDS AS AUTOMATA

THE sudden change that comes over the nature of most birds at the nesting season is, perhaps, the most wonderful phenomenon in nature. Active, restless birds, which normally spend the whole day on the wing, are content to sit motionless in a cramped position upon the nest for hours together. Birds of prey, whose nature it is to devour every helpless creature that comes within their grasp, behave most tenderly towards their young, actually disgorging swallowed food in order to provide them with a meal. Timid birds become bold. Those which under ordinary circumstances will not permit a human being to approach near them, will sometimes, while brooding, actually allow themselves to be lifted off the nest.

At the breeding season intelligence, which counsels self-preservation, gives way before the parental instinct, which causes birds to expose themselves to danger, and, in some cases, even to sacrifice their lives for the sake of their offspring.

From the construction of the nest until the time when the young ones are fledged the actions of the parent birds are, at any rate in the neighbourhood of the nest, those of automata, rather than of creatures endowed with intelligence.

On this hypothesis alone are many of the actions of nesting birds comprehensible.

That the construction of the nest is in the main an instinctive habit and not the result of intelligence is proved by the fact that a bird which has been hatched out in an incubator will, at the appointed season, build a nest. If birds were not guided by instinct they would never take the trouble to do such a quixotic thing. What benefit can they derive from laboriously collecting a number of twigs and weaving them into a nest?

It is, of course, natural selection that has originated this instinct; for those species in which the parental instinct is not developed, or in which there is not some substitute for it, must inevitably perish. When once this instinct has taken root natural selection will tend to perpetuate it, since those species which take the best care of their young are those which are likely to survive in the struggle for existence.

Many instances can be adduced to show how automatic are the actions of birds at the nesting season.

It sometimes happens that a bird lays an egg and then proceeds to build a nest on top of it.

Again, some birds do not know their own eggs. A whole clutch of different ones may be substituted for those upon which the bird is sitting and the bird will not discover the change.

The well-known bird-photographer, Mr. R. Kearton, was desirous of obtaining a good photograph of a sitting thrush, and as he was afraid that her eggs would be hatched before a fine, sunny day presented itself, had some wooden dummies made. These he painted and

varnished to look like those of the thrush, and put them in the nest, wondering whether the bird would be deceived. He need not have wondered; she would probably have sat upon the shams even had they not been coloured.

Upon another occasion Mr. Kearton replaced some starling nestlings by his wooden eggs, and waited to see what would happen. "In a few minutes," he writes, "back came the starling with a rush. She gazed in wonder at the contents of the nest for a few seconds, but, quickly making up her mind to accept the strangely altered condition of things, she sat down on the bits of painted wood without a trace of discontent in either look or action. Putting her off again, I reversed the order of things and waited. Upon returning, the starling stared in amazement at the change that had come over the scene during her absence; but her curiosity soon vanished, and she commenced to brood her chicks in the most matter-of-fact way." Then Mr. Kearton took out the chicks and put his fist into the nest, so that the back of his hand was uppermost. The starling actually brooded his knuckles. We must, of course, remember that a starling's nest is in a hole, where there is but little light. But, provided the starling could not see him, I believe that she would have brooded his knuckles broad daylight.

Crows, the most intelligent of birds, will sit upon and try to hatch golf balls and ping-pong balls. One famous kite in Calcutta sat long and patiently in a vain attempt to make a pill-box yield a chick, while another member of this species subjected a hare's skull to similar treat-

ment. Upon one occasion I took a robin's egg that was quite cold and placed it among the warm ones in a blackbird's nest. The hen came and brooded the egg along with her own without appearing to notice the addition, although it was much smaller than her eggs and of a totally different colour.

In the same way, if a set of nestlings of another species be substituted for those already in the nest, the parent birds will usually feed the new family without noticing the change. Instinct teaches a bird to brood all inanimate objects it sees in the nest and to feed all living things, whether they be its own offspring or not, and many birds blindly obey this instinct. It is, of course, to the advantage of the species that this should be so. For it is only on very rare occasions that foreign objects get into a nest, and nature cannot provide for such remote contingencies.

Similarly, instinct will not allow a bird to pay any attention to objects outside the nest, even though these objects be the bird's own offspring.

As everybody knows, the common cuckoo nestling ejects its foster-brethren from the nest, and if the true parents were able to appreciate what had happened, how much sorrow among its victims would the cuckoo  cause! As a matter of fact, no sorrow at all is caused. Incredible as it may seem, the parent birds do not miss the young ones, nor do they appear to see them as they lie outside the nest. In this connection I cannot do better than quote Mr. W. H. Hudson, who was able to closely observe what happened when a young cuckoo had turned a baby robin out of the nest. "Here,"

writes Hudson, "the young robin when ejected fell a distance of but five or six inches, and rested on a broad, light green leaf, where it was an exceedingly conspicuous object; and when the mother robin was on the nest—and at that stage she was on it the greater part of the time—warming that black-skinned, toad-like, spurious babe of hers, her bright, intelligent eyes were looking full at the other one, just beneath her, which she had grown in her body and had hatched with her warmth, and was her very own. I watched her for hours; watched her when warming the cuckoo, when she left the nest, and when she returned with food and warmed it again, and never once did she pay the least attention to the outcast lying there close to her. There on its green leaf it remained, growing colder by degrees, hour by hour, motionless, except when it lifted its head as if to receive food, then dropped it again, and when at intervals it twitched its body as if trying to move. During the evening even these slight motions ceased, though the feeblest flame of life was not yet extinct; but in the morning it was dead and cold and stiff; and just above it, her bright eyes upon it, the mother robin sat on the nest as before warming the cuckoo."

Even those actions of nesting birds which appear to be most intelligent can be shown to be merely automata. Take, for example, the curious habit of feigning injury, which some birds have, when an enemy approaches the young, in order to distract attention from them to itself and thus enable them to seek cover unobserved. This surely seems a highly intelligent act. But birds sometimes act thus before the eggs are hatched, and by so

doing actually attract attention to the eggs. This action is purely instinctive, and is perpetuated and strengthened by natural selection because it is beneficial to the race.

We have seen how at the nesting season all a bird's normal actions and instincts are subordinated to those of incubation. It is therefore but reasonable to suppose the incubating bird to be in a very peculiar and excitable state, a state bordering on insanity.

A bird in this condition might be expected to go into something resembling convulsions on the approach of an enemy, and, provided its acts under such circumstances tended to help the offspring to escape, and were at the same time not sufficiently acute to cause the mother bird to fall a victim to the enemy, natural selection would tend to perpetuate and fix such actions.

Want of space prevents further dilation upon this fascinating subject.

To sum up the conclusions I desire to emphasise. A bird has during the greater part of its life only to look after itself, and the more intelligent it be the better will it do this, hence natural selection tends to increase the intelligence of birds. But, at certain seasons, it becomes all-important to the species that the adults should attend to their young, even at risk to themselves. To secure  Nature has placed inside birds a force, dormant at most times, which at periodic intervals completely overrides all normal instincts, a force which compels parent birds to rivet their attention on the nest and its contents. Thus the sudden conversion of birds into automata is a necessity, not a mere whim of Dame Nature. The instinct is not of very long duration; for as soon as the

young are able to fend for themselves, the parents sometimes behave in what seems to human beings a most unnatural way : they drive off their offspring by force. As a matter of fact, this behaviour is quite natural ; it is dictated by Nature for the benefit of the species. Strong as the maternal instinct is, it is liable to be overridden by stronger instincts, such as that of migration. When the time for the migratory journey comes round, the parent birds will desert, without apparently a pang of remorse, or even a thought, the broods for whose welfare they have been slaving day and night. This desertion of later broods by migratory birds is far commoner than is generally supposed. In 1826 Mr. Blackwell inspected the house-martins' nests under the eaves of a barn at Blakely after the autumnal migration of these birds. Of the twenty-two nests under the eaves inspected on 11th November, no fewer than thirteen were found to contain eggs and dead nestlings.

PLAYING CUCKOO

ORNITHOLOGICAL experience led me some time back to the belief that at the nesting season a bird becomes a creature of instinct, an organism whose actions are, for the time being, those of a machine, a mere automaton. This view, which has been set forth in the preceding article, is not held by all naturalists. I therefore determined to undertake a systematic series of experiments with a view to putting it to the test. In other words, I decided to play cuckoo. I selected the Indian crow (*Corvus splendens*) as the subject of my experiments, because it is the most intelligent of the feathered folk. If it can be proved that when on the nest the actions of this bird are mechanical, it will follow that the less intelligent birds are likewise mere automata when incubating. Another reason for selecting the crow as my victim is that I have been investigating the nests of the koel (*Eudynamis honorata*), which is parasitic on the crow, and in so doing have had to visit a large number of crows' nests.

The crow lays a pale blue egg blotched with brown, while the egg of the koel is a dull olive-green also blotched with brown. It is considerably smaller than the crow's egg. I have seen dozens of koel's eggs, but never one that

a human being could possibly mistake for that of a crow, yet our friend *Corvus* is unable to detect the strange egg when deposited in the nest and sits upon it. It is not that birds are colour-blind. The koel is able to distinguish its own egg from that of the crow, for, after it has deposited its egg, it frequently returns to the nest and removes one or more of the crow's eggs! I am convinced that ordinarily a crow would have no difficulty in distinguishing between the two kinds of egg; but at the nesting time it throws most of its intelligence to the winds and becomes a puppet in the hands of its instincts, which are to sit upon everything in the nest.

I have myself placed koel's eggs in crows' nests, and in every case the crow has incubated the eggs. On one occasion I came upon a crow's nest containing only two koel's eggs. As the nest was some way from my bungalow and in an exposed situation, I knew that, the moment I left, it would be robbed by some mischievous native boy, so I took the eggs and placed them in a crow's nest in my compound. This already contained three crow's eggs, two of which I moved, substituting the koel's eggs for them. The crow's eggs had only been laid three or four days, but the koel's eggs were nearly incubated, since both yielded chicks on the third day after I placed them in the nest. If nesting ch~~ck~~ think, that pair must have been somewhat surprised at the speedy appearance of the chicks!

In all, I have placed six koel's eggs in four different crow's nests, and as I have already said, in no single instance did the trick appear to be detected. In the majority of cases, I did not trouble to keep the number

of eggs in the nest constant. I merely added the koel's egg to those already in the nest.

But I have put my theory to a much more severe test. In a certain crow's nest containing two eggs I put a large fowl's egg. This was cream-coloured and fully three times the size of the crow's egg, yet within ten minutes the crow was sitting comfortably on the strange egg. She did not appear to notice the considerable addition to her clutch. She subsequently laid three more eggs, so that she had six eggs to sit upon, five of her own and the large fowl's egg! Day after day I visited the nest and watched the progress of the strange egg. On the twentieth day the chick inside was moving, but when I went to the nest on the twenty-first day I discovered that some one had climbed the tree, for several branches were broken. Two young crows had been taken away and the fowl's egg thrown upon the ground. There it lay with a fully formed black chicken inside! I have that chicken in a bottle of spirit. Subsequent inquiry showed that the *dhobi*'s son had taken it upon himself to spoil my experiment. However, it went sufficiently far to prove that crows may one day become birds of economic value; why not employ them as incubators? Had the crow come across that chick's egg anywhere but in its nest, it would undoubtedly have made its breakfast off it.

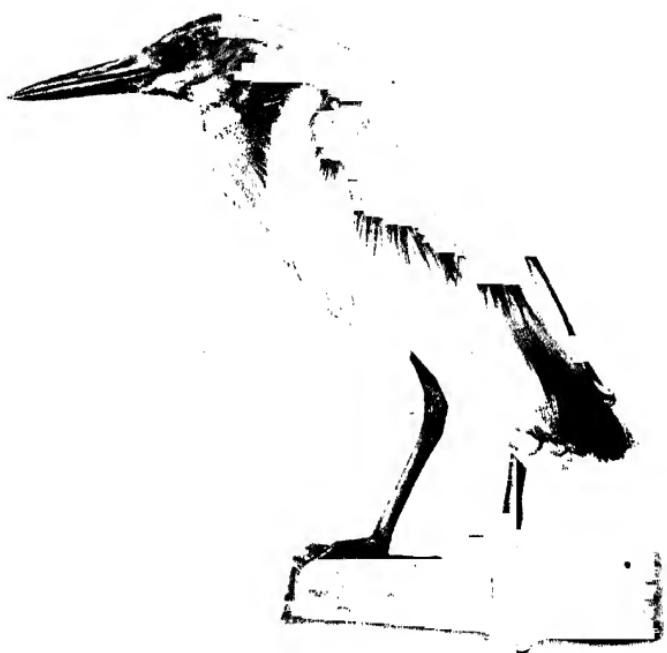
I repeated the experiment in another nest. This time the chick hatched out. When it appeared the rage of the crows knew no bounds. With angry squawks the scandalised birds attacked the unfortunate chick, and so viciously did they peck at it that it was

in a dying state by the time my climber reached the nest.

With a view to determining at what stage the incubating instinct secures its dominance, I placed another fowl's egg in a crow's nest that was almost ready to receive eggs, wondering whether the presence of this egg would stimulate the crow to lay, without troubling to give the final touches to the nest. The bird devoured the egg. It is my belief that the acts of a nesting bird do not become completely automatic until it has laid an egg in the nest. If one visits a crow's nest which is in course of construction, the owners will as likely as not desert it; but I have never known a crow desert its nest when once it has laid an egg—provided, of course, he who visits the nest leaves any eggs in it.

In another nest containing two crow's eggs I placed a golf ball; on returning next day I found the crow sitting tight upon her own two eggs and the golf ball!

But in another case, where I had found two eggs and substituted for them a couple of golf balls, the crow refused to sit. I suppose the idea was, "I may be a bit of a fool when I am nesting, but I am not such a fool as all that!" I once came across a young koel and a crow's egg in a nest. I removed the former and placed it in a crow's nest containing four crow's eggs. The owner of the nest showed no surprise at the sudden appearance of the koel, but set about feeding it in the most matter-of-fact way. The young koel was successfully reared; it is now at large and will next year victimise some crow. I may say that no human being could possibly fail to distinguish between a young koel and a young



THE INDIAN PADDY BIRD. (*ARDEOLA GRAYII*)



THE GREY PELICAN. (*PELECANUS PHILIPPENSIS*)
(Ulid of the Plains)

